50 CENTS

CONSTRUCTION

METHODS AND EQUIPMENT

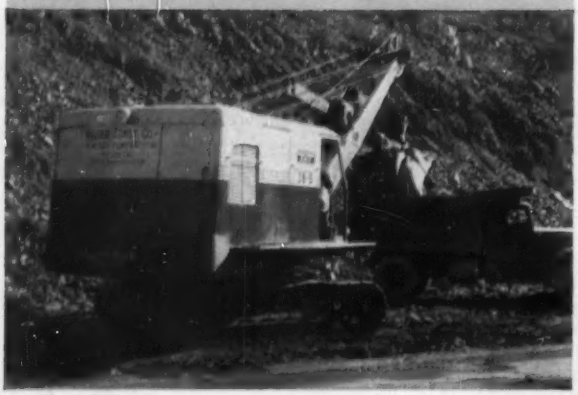
February 1956



A McGRAW-HILL PUBLICATION

EVERYWHERE YOU LOOK
ON ROSSER'S SPREAD YOU SEE
Yellow Strand

Here's why, as told in D. M. Rosser's own words: "We have used X brand rope, but found Yellow Strand Wire Rope held up much better!" You'll see plenty of proof that he means what he says by the Yellow Strand Rope on all of his equipment shown working near Mount Joy, Pa., on U. S. 122. Take a tip from Rosser Constr. Co. and equip your cable-operated machines with B & B Yellow Strand Wire Rope. Call your nearest B & B Distributor for fast, efficient service.



ON SHOVELS . . .
Yellow Strand **loads out 500 yds. per day.**



ON SCRAPERS . . .
Yellow Strand **keeps scraper producing at top efficiency.**



ON BULLDOZERS . . .
Yellow Strand **gives trouble-free operation.**



ON BACKHOE . . .
Yellow Strand **takes the shock of rock digging.**

Yellow Strand®

Manufacturers of Wire Rope for 80 Years

Broderick & Bascom Rope Co.
4203 Union Blvd., St. Louis 15, Mo.



American Logging Tool Corporation is a subsidiary of Broderick & Bascom Rope Co.

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER



Now they cut through rock with fire

A typical example of B. F. Goodrich improvement in rubber

THE white flame shooting out of the metal pipe is 3800 degrees hot. So hot that it eats through 25 feet of solid granite in *an hour*—something that used to take two men with drills all day long. The spitting fire is made right there in the pipe—a mixture of oxygen and fuel oil fed to the pipe through rubber hose.

The equipment maker wanted a hose that wouldn't go to pieces in a few days from the pressure, oil and heat. His men talked it over with B. F. Goodrich and learned that engineers had developed a hose for just such jobs.

They found a way of reinforcing the hose with strong cords that stand over 5 times the pressure needed to shoot the flame—protecting the man who does the work. They developed a special rubber for the inside that stands oil without rotting or weakening.

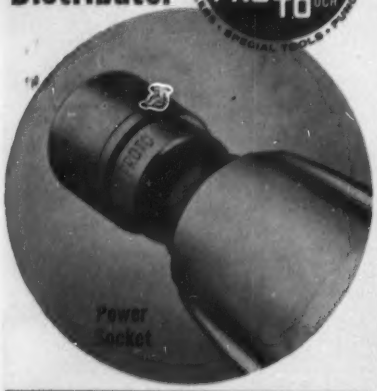
The B. F. Goodrich hose that carries the oxygen, fuel oil, and cooling water to the jet pipe had been on the job *8 months* when the picture was taken, is still going strong.

This is an example of the ways B. F. Goodrich engineers find to make rubber save money for users—either by doing a job other rubber can't do, or by lasting longer, or by replacing other more expensive materials. Your B. F. Goodrich distributor would like to tell you what these improvements are, and how they can be employed for your profit. *The B. F. Goodrich Company, Dept. M-551, Akron 18, Ohio.*

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INDUSTRIAL PRODUCTS DIVISION

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CONSTRUCTION

Volume 38 Number 2 **METHODS** Established 1919

AND EQUIPMENT

February 1956

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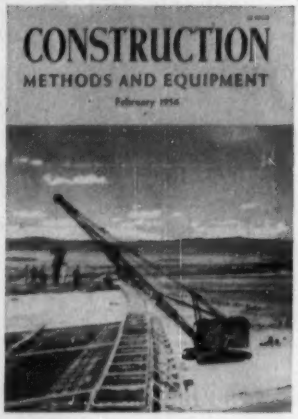
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On the Cover

Colorado's mountains make a scenic background for this photo of a Northwest crane at work building an overpass on the Denver Turnpike between Denver and Colorado Springs. The crane handles a 1-yd Garbro concrete bucket on a 55-ft boom to place concrete. Contractor is Harry Shore Co., Littleton, Colo.

CONCRETE WORK

Any contractor who does concrete work will find CM&E's series of articles on Concrete Mixing and Placing useful. Reprints are available in booklet form. Single copies are 50¢; for orders of 10 copies or more, the price is 40¢ each. Address your order to the Editor.

Member ABP

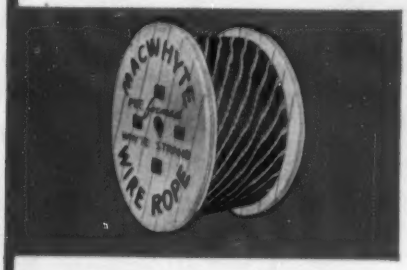
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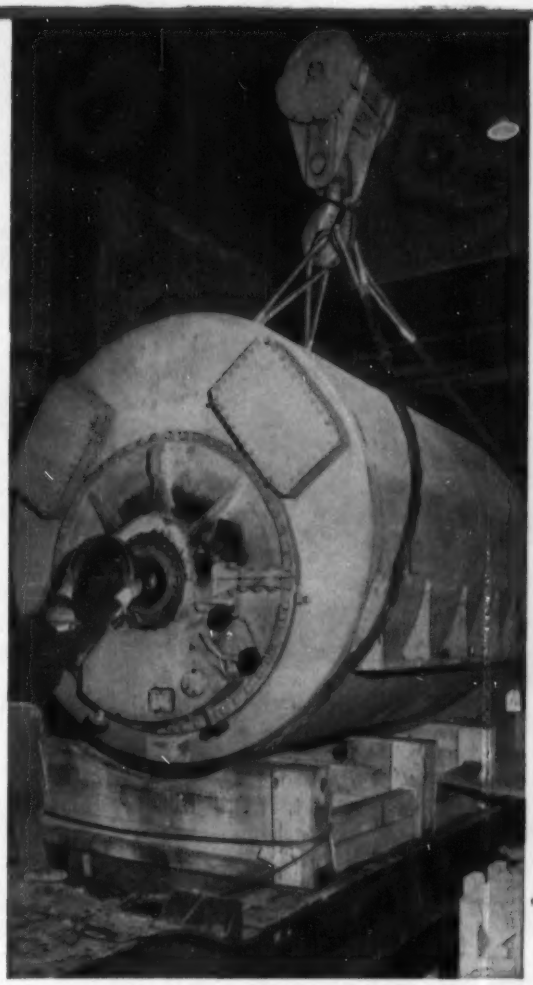
Macwhyte manufactures a wide variety of sizes and types to provide materials best suited to your needs.

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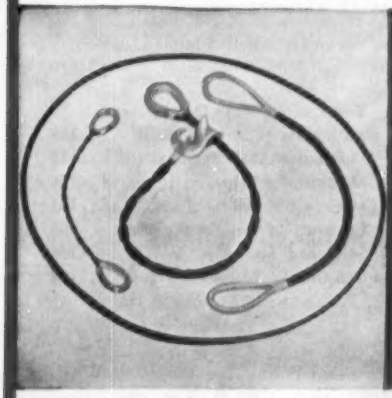
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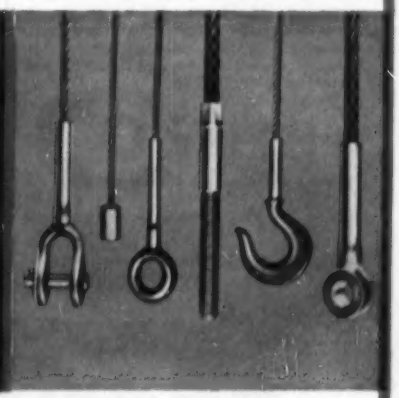
ROUND-BRAIDED SLINGS: Two Macwhyte ATLAS Round-Braided Slings handling 125-ton generator unit. These are Type No. 1 Slings made of alternate left and right lay wire rope, braided for light weight, maximum flexibility, and safety.



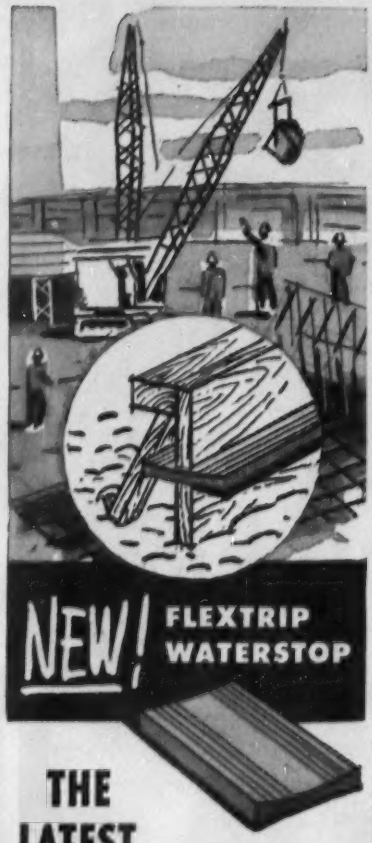
SLINGS: Macwhyte makes a wide range of sizes and types of Braided and Single-Part wire rope slings. Custom designs are made to meet special needs. For information, ask for Catalog S-8.



WIRE ROPE: There is a right rope for each equipment need. Catalog G-16 lists all classifications and sizes, also included is general information on handling and use of wire rope.



ASSEMBLIES: Macwhyte "Safe-Lock" Wire Rope Assemblies are made in a wide range of sizes, with fittings permanently attached to one or both ends. Many standard types are listed in Catalog No. 5201.



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Company_____

Address_____

City_____ Zone____ State____

Pay Dirt in This Issue

February, 1956

Good Forming Ideas Simplify Deck Paving 50
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NEXT MONTH

Spinning the suspension cables for the Walt Whitman Bridge linking Philadelphia and Gloucester City, N.J., is going ahead 16 hours a day. CM&E will bring you a report of this work next month.



WORKABLE, PLASTIC concrete mixes made with Atlas Duraplastic Cement helped speed construction of both structural and paving portions of Ohio State Highway, Beechmont Levee Project at Cincinnati, O. Contr.: Vest & Bartell, Cincinnati.

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Both paving and structures are built to last longer . . . when they're made with Atlas Duraplastic* air-entraining portland cement. For Atlas Duraplastic cement gives concrete greater durability . . . fortifies it against freezing-thawing weather and scaling caused by de-icing salts.

Atlas Duraplastic cement also gives concrete mixes greater workability that aids proper placement . . . gives them more cohesiveness to resist segregation. Paving jobs finish easily, and in structural concrete, surface appearance is improved.

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United States Steel Hour—Televised on alternate Wednesdays—See your local newspaper for time and station.



...*because* Transite® Pressure Pipe goes in fast, pushes the excavator

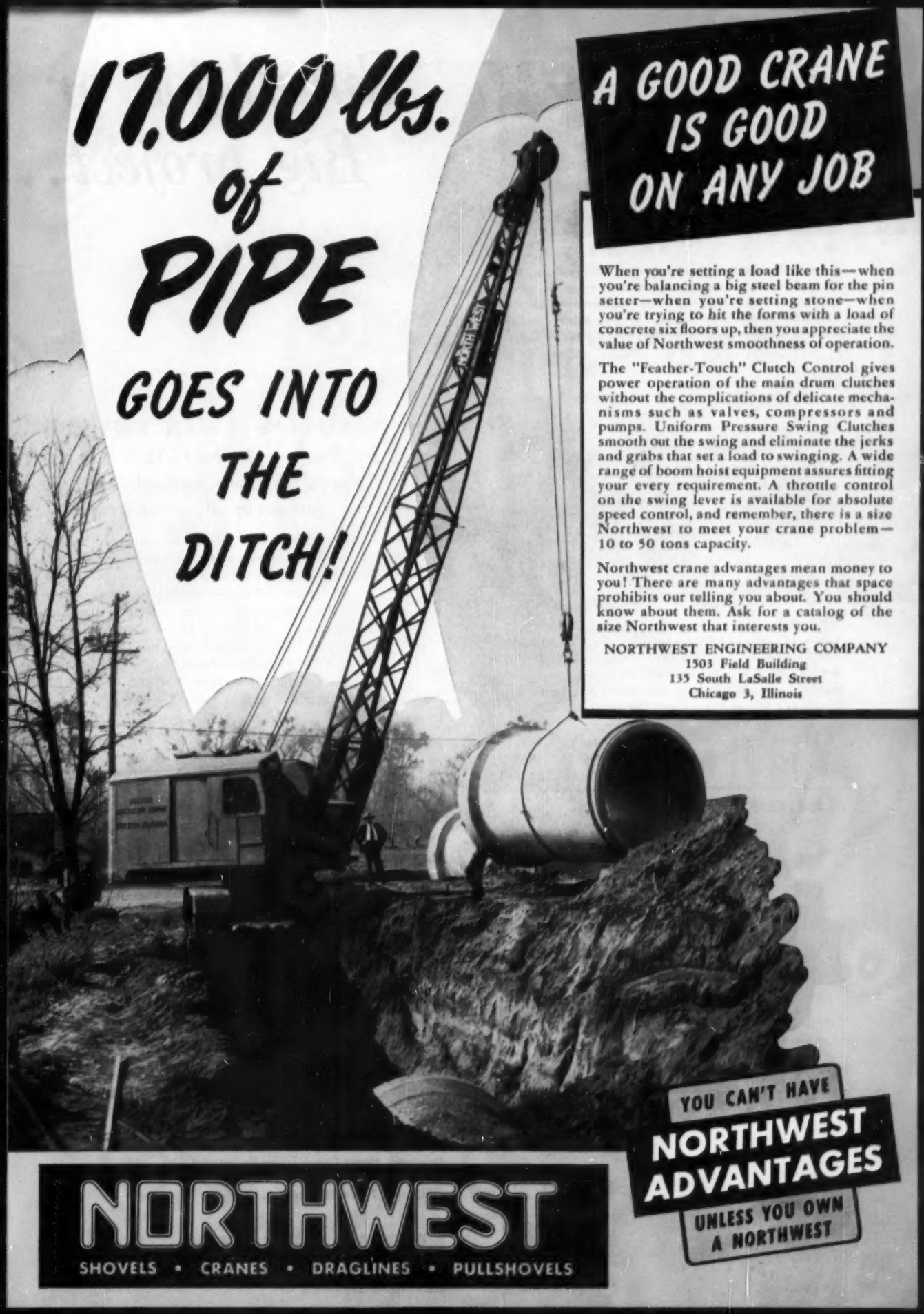
HANDLING and assembly of Transite Pressure Pipe and the Ring-Tite® Coupling are so simple—and yet so sure—that the laying crew can install the pipe as fast as the trench is opened. This means less time on the job, means *appreciably lower* costs.

The Ring-Tite Coupling makes consistently tight yet always flexible joints with automatic positioning of pipe ends within the joint. And rubber rings can't blow out.

You can assure city officials and engineers of peak performance, year after year. Transite Pipe, an asbestos-cement product is strong, durable, highly resistant to corrosion.

For further information about Transite Pressure Pipe and Ring-Tite Coupling, write for Booklet TR-160A. Address Johns-Manville, Box 60, New York 16, N. Y. In Canada, Port Credit, Ontario.

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WITH THE NEW RING-TITE COUPLING


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GOES INTO
THE
DITCH!
A GOOD CRANE
IS GOOD
ON ANY JOB
When you're setting a load like this—when you're balancing a big steel beam for the pin setter—when you're setting stone—when you're trying to hit the forms with a load of concrete six floors up, then you appreciate the value of Northwest smoothness of operation.
The "Feather-Touch" Clutch Control gives power operation of the main drum clutches without the complications of delicate mechanisms such as valves, compressors and pumps. Uniform Pressure Swing Clutches smooth out the swing and eliminate the jerks and grabs that set a load to swinging. A wide range of boom hoist equipment assures fitting your every requirement. A throttle control on the swing lever is available for absolute speed control, and remember, there is a size Northwest to meet your crane problem—10 to 50 tons capacity.
Northwest crane advantages mean money to you! There are many advantages that space prohibits our telling you about. You should know about them. Ask for a catalog of the size Northwest that interests you.
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SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

Small job or Big project..



On this Florida Turnpike contract of Blythe Bros., two TS-18 "Eucs" loaded, hauled and dumped in sandy conditions that "hung up" other equipment. The tremendous power and traction of this Euclid scraper made it a logical choice for this tough job.



Western Contracting Corp. used 12 of these TS-18 Euclid Scrapers on a 7 million yard Indiana Turnpike job. Because of the extremely difficult sandy conditions, the tractors were equipped with 300 h.p. engines. Top extensions added 6½ yds. to the bowl capacity.

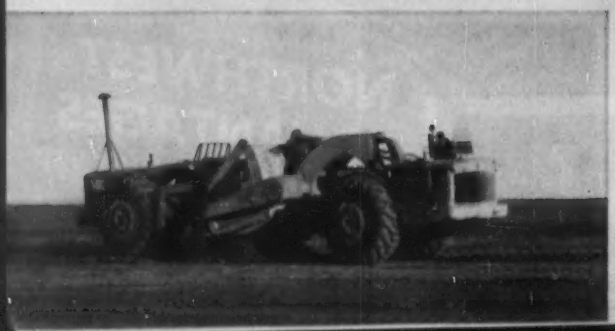
EUCLID TWIN POWER

in the TS-18 provides more work-ability than you get in any other scraper

Twin-Power—the use of two engines driving separate axles—was pioneered in the earth moving field by Euclid 10 years ago. Torque converters and semi-automatic transmissions assure easy operation and a smooth flow of power matched to all job conditions. One of Euclid's newest scraper models, the TS-18 uses power and drive components that have proved their dependable performance in other "Eucs" on hundreds of jobs.



The TS-18 is powered by two 218 h.p. engines—one in the tractor and another behind the scraper bowl. For work where even more power can be used, a 300 h.p. engine for the tractor is available. Both engines drive through separate Torqmatic Drives. Standard tires are 27.00 x 33 with 33.50 x 33 available as optional equipment.



Lever action and hydraulic control of bowl, apron and ejector make the TS-18 easy to operate. At the Glasgow Air Base in Montana, Harris Construction Co. used 4 of these Twin-Power Scrapers for grading and construction of runways.

EUCLID DIVISION
GENERAL MOTORS CORPORATION
Cleveland 17, Ohio

this TS-18 "Euc" *cuts earth moving costs!*



VERSATILITY
for a wide range of work!

This TS-18 is the most recent development of the Twin-Power principle pioneered by Euclid and job proved in earlier scraper models. Its unequalled power and traction gets more work done... sets a new standard for low cost scraper yardage. Self-loading in practically any material from loose sand to hard shale, the TS-18 is a one-man earthmoving spread. It works on steep grades and under job conditions that stymie other scraper equipment.

Hydraulic lever action does away with cable headaches and expense. All scraper operations—bowl, apron and ejector—are independently controlled. All four of the hydraulic jacks are interchangeable... one spare fits anywhere. The low, wide bowl design and reversible four-section cutting blade make the TS-18 easy to load ... heaped loads up to 24 yds. are picked up fast.

Like all other Euclid Scrapers, the TS-18 is built to stay on the job with less down-time for servicing and repair. All major components are readily accessible... a feature that really pays off in more work-ability and lower maintenance cost. Your Euclid dealer has facts and figures showing why owners everywhere say that ***Euclids are your best investment.***

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE



More batches per shift...
More accurate batching...
for every big highway job

with

BLAW-KNOX BATCHING PLANTS

Speed—to build roads faster!

Accuracy—to meet exacting specifications!

That's what you need in batching plant operations for every section of the country where there's a road a-building.

And that's what you get with Blaw-Knox Batching Plants! Blaw-Knox batching speed comes from over-all *balanced* construction . . . operation of each component fits the others with dove-tailed precision. That Blaw-Knox *better* design and construction assures accuracy, another important consideration when you have to meet specs allowing ¼ of 1% tolerance, as the plant illustrated did for one owner on the Ohio Turnpike.

Wherever you see a big turnpike project, you'll see Blaw-Knox batching plants. Perhaps the same ones you saw last year on the New York Thruway, you'll see next year on the Iowa Toll Road. They're adaptable to conditions in every section of the country.

Ask your Blaw-Knox dealer about the many sizes and combinations available to make money for you.



400 bbl. Hi-Bin and Cement Batcher fed by Blaw-Knox Elevator keep trucks rolling at a profitable rate.



100-ton, 3-compartment Aggregate Bin with twin batcher meets high speed paving requirements.

BLAW-KNOX

BLAW-KNOX COMPANY

Construction Equipment Division • Mattoon, Illinois

Construction News from Washington . . .

Washington, D.C.
February, 1956

Eisenhower lays out huge construction program

Contracts for billions of dollars of construction all around the country are in the Administration's program for the year that begins next July 1. The Republican plan of spending calls for a step-up in construction dollars paid out—up to $5.3 billion from the $4.9 billion estimated for the current year.

In addition to federal spending, Eisenhower's team also wants to increase the government's role as a stimulator — and guarantor — of private investment in construction. There are new programs of mortgage guarantees for medical buildings, of special housing designed for older people, and of increased authorization for government agencies to buy up mortgages from lenders.

Water projects get a boost

Scores of new projects for navigation, for flood control, and the like are included:

The President asks for money to start 42 new navigation projects costng up to $6 million each. Total cost to complete the entire batch runs to $200 million.

One big program calls for $110 million for deepening connecting channels of the Great Lakes to accommodate vessels that will be using the 27-ft channel of the St. Lawrence Seaway.

Flood control construction will mean something in the New England area for the first time in years; the new program before Congress is even larger than predicted last month (CM&E, Jan. 1956, p 9). All told 19 new dams are in the Administration request—and the President asks money to begin five new dams in New England and Pennsylvania before June 30.

The big Upper Colorado Storage Project—now cut down to about $800 million, all told—may well get the green light this year. The controversial Echo Park Dam has been taken out of it. That brings down the cost and weakens the opposition.

"Bloom is off the Rose" for Housing

Mass housing developers predict a sharp drop in home building in 1956. They tell the government that unless credit is made easier for the home buyer, contractors will fall far short of the 1955 total of housing starts—1,330,000. Predictions run anywhere from 1,100,000 to 1,200,000.

Even an easier mortgage market would not solve the big builder's problems. Local government regulations are helping push up the cost of housing. Cities are putting into effect stiffer regulations for

Continued on next page

utility installations, street improvements, and lot sizes (which are generally going up).

Materials and labor costs are rising, too. And home buyers are demanding more luxurious accoutrements—completely modern kitchens, more bathrooms, and larger living areas.

More money for government housing

Loans for building college housing are going big. The Administration expects the current $500-million fund to be used up in the coming year and is asking for another $100 million.

The Defense Department expects to build about 100,000 new housing units this year and next at a total cost of about $1.3 billion. Urban renewal housing—private improvement of housing in slum and blighted areas—is headed up. The President expects the government to insure about 75,000 units during fiscal 1957.

All this is in addition to regular public housing—for which the Administration wants another 35,000 per year.

Aid to airports will expand

The Administration is pressuring for more federal money for construction at civilian airports. The program for next year calls for a doubling of this year's $24 million; this money, of course, has to be matched dollar-for-dollar. The money would be spent at about 420 airports.

Spending for military airport construction generally will be about the same next year, but there may be a political fight about this. Air Force wants to speed up spending to get its bases built quicker.

Taft-Hartley revision is stymied

The building trades unions are still pushing for amendments to the Taft-Hartley Act, but chances are slim that Congress will do anything at all. Neither the Administration, the Democratic majority in Congress, nor the bulk of union labor are sufficiently interested to make a fight this year.

Only building trades president Richard Gray is making a concerted drive. He wants: (1) The right to sign union contracts with the constructor before the job begins, (2) A reduction in the waiting period before a worker must join the union under a union shop from 30 to seven days, (3) The right of union workers to refuse to work alongside non-union men.

Gray also wants to give the Secretary of Labor enforcement power over Davis-Bacon Act prevailing wage determinations. Now, the agency handling the government construction, also handles wage policies. Gray also wants the eight-hour day law tightened to require time and a half overtime for work in excess of 40 hours a week and on week ends.



For rugged off-the-road operation

TOUGHEST CHASSIS GREASE EVER MADE

New Purelube Heavy Duty Chassis Grease lasts 1⅗ to 2½ times longer than available chassis greases

New Purelube Heavy Duty Chassis Grease is tougher than any chassis grease you've ever been able to buy. It was developed for the most severe load and operating conditions. It won't splatter out, even on continuous off-the-road pounding.

Proving ground tests show that this new grease stays on the job 1⅗ to 2½ times longer than greases generally used for chassis lubrication. In extensive field tests, it continued to protect chassis parts when all other greases failed.

Now let us prove it to you in your own equipment, under your own operating conditions.

Pick out two similar pieces of your equipment operating side by side. Lubricate one of them with new Purelube HD Chassis Grease. Use any competitive grease you choose on the other. Then compare the results and see the difference for yourself.

Try it. Mail the coupon or call your nearest Pure Oil office for a *free demonstration in your own equipment.* (Offer limited to fleets operating in PURE'S marketing area.)

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Be sure with Pure

Sales offices located in more than 500 cities in PURE'S marketing area.

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35 East Wacker Drive, Chicago 1, Illinois

☐ Please send me free folder giving complete information on New Purelube HD Chassis Grease.

☐ I would like a free demonstration of this new chassis grease.

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Company _____

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City _____ Zone _____ State _____

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in all your Construction Equipment



PRODUCTION UP 30%—FUEL COSTS CUT 30%

Arizona Sand & Rock Company replaced a 4-cycle Diesel with a 2-cycle GM Detroit Diesel on this pug mill. Despite clouds of dust, maintenance costs dropped 25%—and production control is better with fast-acting, 2-cycle Detroit Diesel power.



KEEP 600,000-YARD CONTRACT GOING

Marsolino Construction Co. relies on GM Detroit Diesel-powered Ingersoll-Rand Gyro-Flow compressors to keep this 600,000-yard contract moving. They report the Detroit Diesels "start easily—are dependable and economical."



CUTS FUEL COSTS 40%—UPS PRODUCTION 25%

When Miami's R. E. Vaughan, Inc. switched from a 4-cycle Diesel to a 2-cycle GM Detroit Diesel on this ditcher, production jumped 25%—fuel costs dropped 40%. They report the Detroit Diesel delivers more power at less cost, too.



TRAVELS 35 M.P.H. ON THE HIGHWAY

Speed like this *between* jobs means more time on the job for this GM Detroit Diesel-powered Warco grader operated by Michigan's Henry Schmid Sons. Company's Detroit Diesel-powered dragline has worked over 17,000 hours on $100 for repairs.

Name the construction equipment you need—and it's a sure bet that you can get it powered with a General Motors Detroit Diesel.

For more than 150 manufacturers offer GM Detroit Diesel power in over 1,000 different applications—*because it's America's first choice Diesel!* With their reputations riding on every piece of equipment they sell, it's certain these manufacturers pick the best Diesel available to power their products.

And when you specify a GM Detroit Diesel in your construction equipment you get a Diesel that costs less to buy, less to run, and less to maintain.

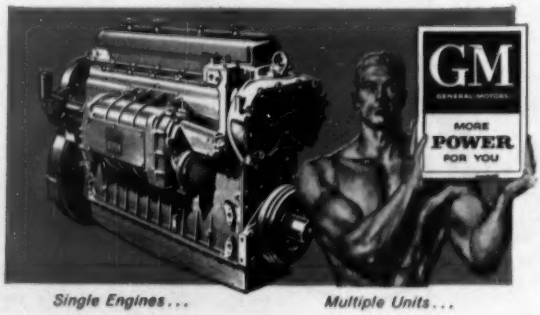
You get a Diesel that delivers more power from a smaller, lighter engine.

And you get a Diesel backed by a nationwide network of GM Detroit Diesel Distributors ready to give you fast service and quick delivery of low-cost parts *day or night.*

Your local GM Diesel Distributor or dealer can give you the list of equipment powered with GM Detroit Diesel engines. Call him today or write direct.

DETROIT DIESEL

Engine Division of General Motors, Detroit 28, Michigan



Single Engines... *30 to 300 H.P.*

Multiple Units... *Up to 893 H.P.*

AMERICA'S LARGEST

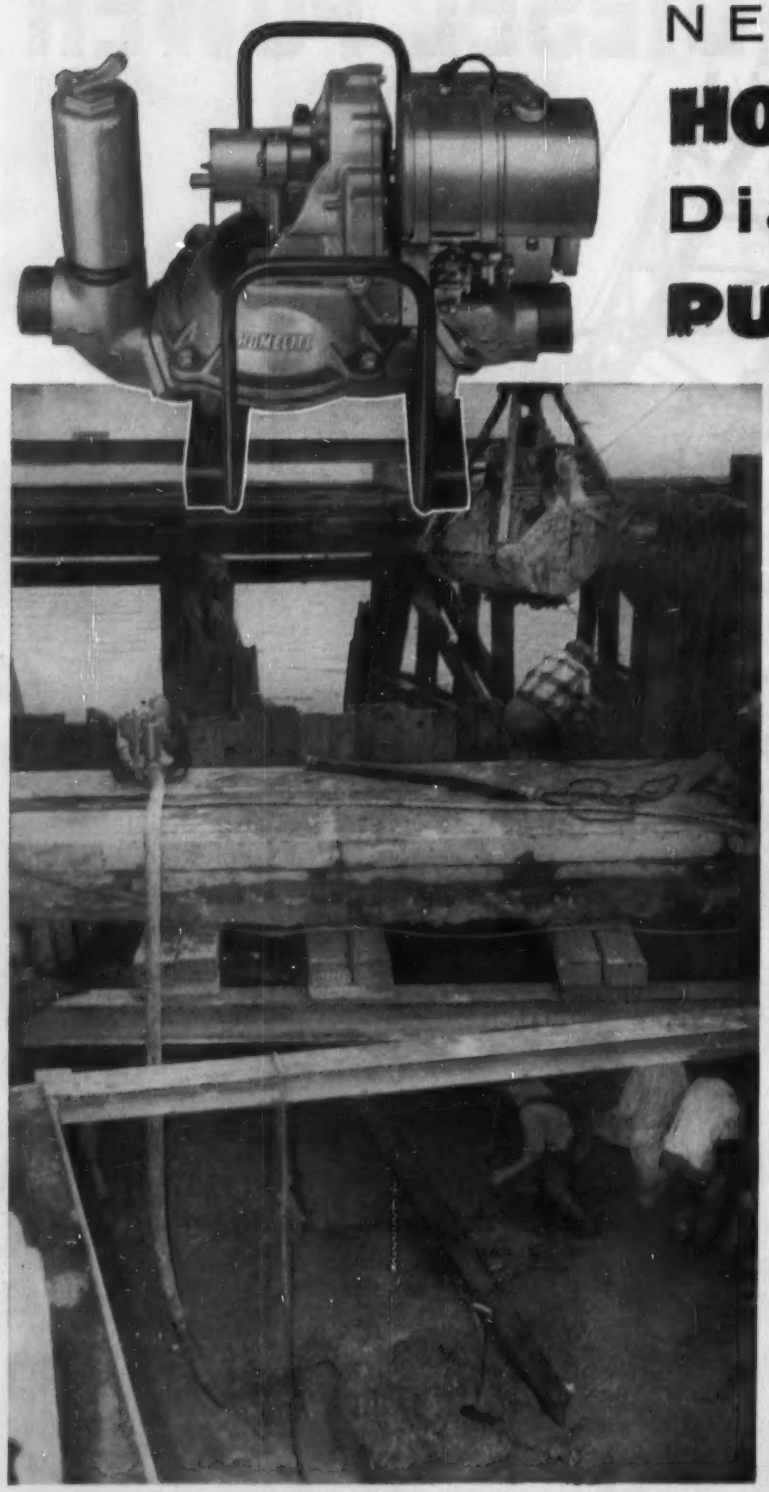
DETROIT DIESEL POWER



NO REPAIRS IN 10,000 HOURS

In 1951, Minnesota's Phelps-Drake Construction Company bought a GM Detroit Diesel-powered Lima Paymaster. And in 1953, they bought a second Paymaster plus a Wellpoint pump—both GM Detroit Diesel-powered. At last report none of the engines had any repairs, were still going strong after more than 10,000 hours. Phelps-Drake also reports production is high—fuel cost low—with Detroit Diesel power.

BUILDER OF DIESEL ENGINES



NEW HOMELITE Diaphragm PUMP

for All Heavy-Duty jobs*

This new, job-tested Homelite diaphragm pump will handle *all* your heavy-duty jobs with greater ease and mobility.

Its new internal design not only pumps up to 5000 gallons per hour but handles sand, mud, solids and muck with equal ease. Because it weighs only 120 pounds, it goes anywhere quickly and easily . . . saves money in labor and haulage costs.

The entire unit construction is keyed to smooth, continuous performance. Flapper valves have special self-cleaning action to prevent clogging. The accumulator holds flow at a steady rate. Gears are totally-enclosed for full protection. Spring skids provide steadier footing, reduce vibration.

Write or call your nearest Homelite representative for complete information or a free demonstration.

**120 pounds for easier carrying*

Model 20DP3 has guaranteed suction lift up to 28 feet and total head up to 50 feet, including friction.

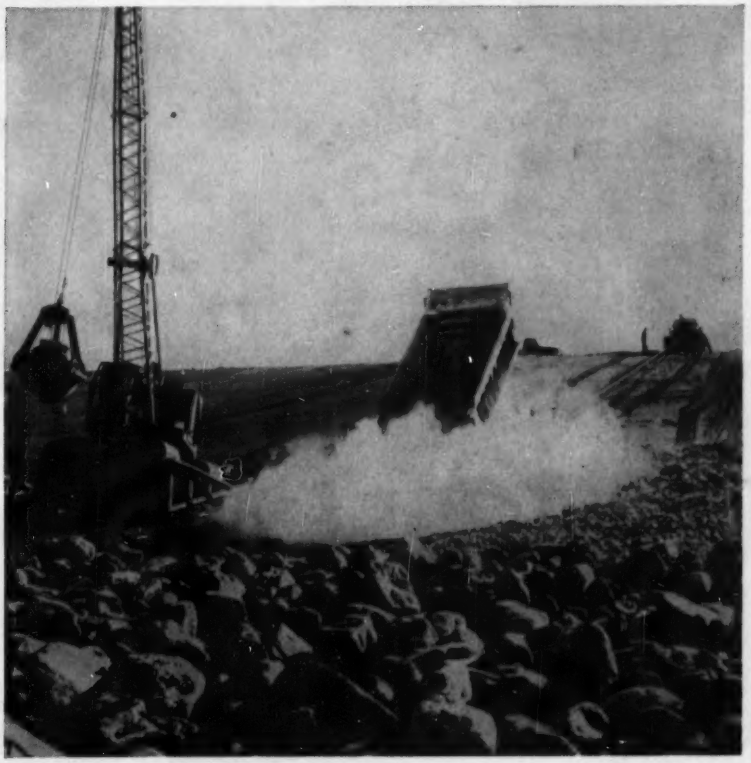
Manufacturers of Carryable
PUMPS
GENERATORS
BLOWERS
CHAIN SAWS

HOMELITE

A DIVISION OF TEXTRON AMERICAN, INC.

1002 RIVERDALE AVE., PORT CHESTER, N. Y.

Job Talk . . .



Tractor's Winch Pulls Unloading Truck up Slope

A 33-deg slope on the upstream face of Oahe Dam in South Dakota presented a tough rip-rapping problem for Missouri Basin Construction Co. But they soon found an answer. A 7-yd International truck was equipped to spread its load of small stone as it was pulled up the slope by a Hyster winch mounted on a Caterpillar D8 tractor. A top course of heavy rip-rap was then placed by an Insley crane To keep level, the crane rode on special skids.



Tank-Mounting Scraper Conquers Soft Silt

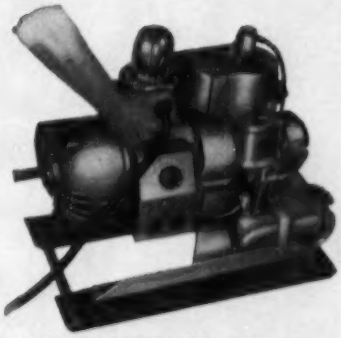
A C Tournapull carrying a 3,000-gal water tank in its scraper bowl solved the problem of pre-soaking soft borrow pits on an irrigation job near Mesa, Washington. Ordinary water trucks had quickly bogged down in the arid waste land. So, Cherf Bros. and Sandkay of Ephrata, Washington equipped a Tournapull with a pressure delivery system that drove high

(Continued on page 20)

CHOOSE
from a full line of
HOMELITE
Carryable
Construction
Equipment



SELF-PRIMING CENTRIFUGAL AND DIAPHRAGM PUMPS
Sizes: 1½" to 3" — capacities to 15,000 g.p.h. for dewatering and water supply.

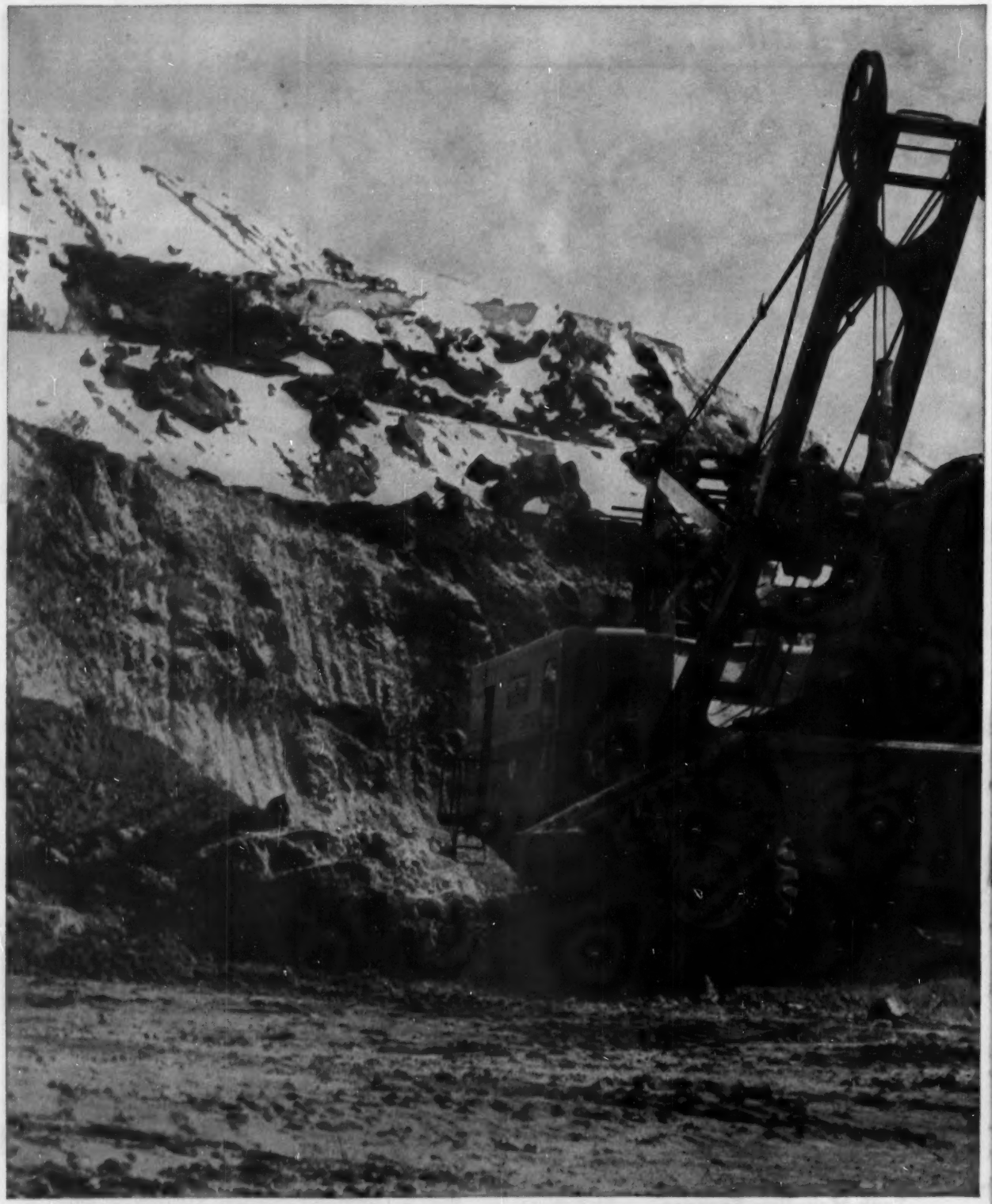


ELECTRIC GENERATOR SETS FOR TOOLS AND LIGHTS
Complete range of sizes and voltages up to 5,000 watts.



LIGHTWEIGHT POWERFUL ONE-MAN CHAIN SAWS
Complete line of saws with clearing and brushcutter attachments for every woodcutting job.

HOMELITE
A DIVISION OF TEXTRON AMERICAN, INC.
PORT CHESTER, N. Y.



TUNE IN:
TEXACO STAR THEATER
starring
JIMMY DURANTE
on TV Saturday nig
METROPOLITAN
radio broad
Saturday afternoons.

TEXACO

TEXACO

When Marfak goes in . . . dirt stays out

TEXACO MARFAK keeps bearings clean, seals out dirt and dust. It won't jar or squeeze out, even under heavy shock loads. And *Texaco Marfak's* tough, moisture-proof film guards against wear and rust. All chassis parts last longer . . . you enjoy high operating efficiency and low maintenance costs.

In wheel bearings, use *Texaco Marfak Heavy Duty*. While sealing out dirt and moisture, it seals itself in. That means safer braking and protection that lasts for thousands of extra miles, with no seasonal change required.

If you want *just one lubricant* to handle all chassis, wheel bearing, water pump and other grease lubrication—*Texaco Marfak Heavy Duty Special 2* is the answer. This new, lithium-base member of the famous *Marfak* family pumps easily at low temperatures and lubricates effectively over a wide temperature range. It resists water washing, stands up under the most rugged service.

More than 600 million pounds of Texaco Marfak have been sold

For transmissions and differentials, *Texaco Universal Gear Lubricant EP* assures smooth, quiet gear operation—lower upkeep costs.

On crawler mechanisms, use *Texaco Track Roll Lubricant*—noted for its full protection against mud and moisture, its ability to prevent rust and reduce wear.

A Texaco Lubrication Engineer will gladly recommend the proper lubricants to help you increase efficiency and bring down costs throughout your operation. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.



TEXACO SIMPLIFIED LUBRICATION PLAN: Saves you time, worry and money . . . reduces your lubricant inventory. With *no more than six* Texaco Lubricants, you can handle *all* major lubrication on any project. Ask your Texaco Lubrication Engineer for full particulars.

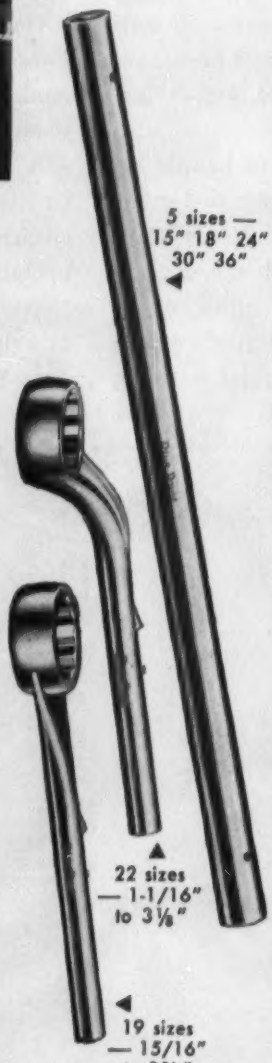
Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT



tools with MUSCLE . . .

to service big equipment



*Snap-on Blue-Point

Heavy-Duty BOXOCKET* WRENCHES

Here are the husky, powerful wrenches servicemen need on every construction machinery repair job. They're safe, dependable . . . the kind mechanics can really "lay into." And they're available in straight or offset models in a wide range of sizes.

The tightest nuts and bolts turn easily under powerful Boxocket leverage. Their trim build and long reach get these tools into location quickly and easily. When free swing is restricted, double hexagon broaching allows a short turning arc. Extension handles lock securely, can't be separated accidentally — a safety factor you and your mechanics will appreciate.

Yes sir, it's tools like *Snap-on* Boxocket wrenches that help cut downtime — put money-making machinery back to work fast. See your *Snap-on* tool dealer or write for new catalog "V" of over 4,000 *Snap-on* tools for servicing construction machinery, trucks and cars.



*Snap-on is the trademark of Snap-on Tools Corporation.

SNAP-ON TOOLS CORPORATION

8042-B 28th Avenue • Kenosha, Wisconsin

JOB TALK . . . Continued from page 17

velocity streams into the material from a perforated pipe placed just ahead of the scraper blade. It was tough going, but the rig managed to keep moving.

When a pit was prepared, a fleet of Tournapulls excavated the moistened dirt and hauled it to the site. Fill was compacted into runway-like strips placed over the centerline of the future irrigation ditch. Later, a dragline moved down the compacted strips, excavating the center, and piled the material on both sides for dikes. The ditch was then lined with concrete.



Hooked Bars Line . . .

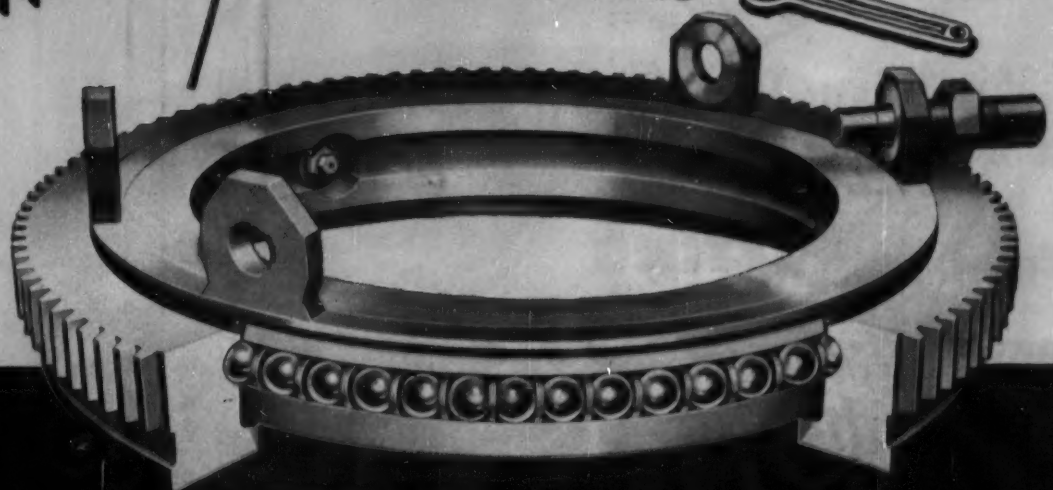


. . . and Level Road Forms

Job-made hand tools developed by Bowyer and Johnson of Jackson, Tenn. speed setting of steel forms for concrete pavements. One tool hooks over the top of the form and shifts it sideways into line. It has two prongs, one for moving in each direction. The other tool tamps the top of the form to adjust its grade.

IMAGINE

NO CENTER PIN OR NUT
NO TURNTABLE ROLLERS
NO ADJUSTMENTS

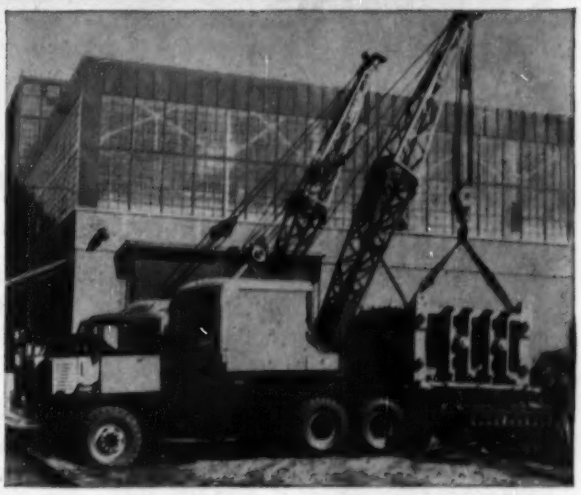


WITH LORAIN'S NEW REVOLUTIONARY

"SHEAR-BALL MOUNTING"

THE GREATEST SHOVEL-CRANE DEVELOPMENT IN YEARS

With this revolutionary type of shovel-crane mounting, the Turntable revolves on a full circle of over 60 hardened steel balls snugly sealed in hardened steel races. In this design, the outer race is attached to the mounting, the inner race is attached to the Turntable . and the design is such that the balls themselves interlock the two races and thus hold the Turntable on the mounting. As a result, the balls take all vertical, horizontal and radial loads and thrusts; consequently, there is no need for a center pin and center pin nut, no need for a centering gudgeon and bushing, no need for Turntable top rollers or hook rollers, no need for an exposed roller path. And, thus, all the constant adjustments and other nuisances of these items are also banished forever for shovel-crane users.



At present, this new development in shovel-crane mountings is standard on 30-ton rubber-tire Lorains; is available as optional equipment on (1) 20- and 25-ton crawler machines and (2) 25-ton rubber-tire Lorains, in which case it permits greater lifting capacities when working on outriggers. Be sure to get all of the money-making facts about the new "Shear Ball Mounting" from your Thew-Lorain Distributor!

THE THEW SHOVEL CO., LORAIN, OHIO, U.S.A.

THEW LORAIN®



The Wonder Grease for Concrete Forms

REGARDLESS of whether you use steel or wooden forms for concrete work — you can apply Globe Form Grease by spray, brush, or swab. This time-tested paste emulsion will reduce peeling and pitting to a minimum when forms are removed, and practically eliminate patching.

Due to its special adhering qualities, Globe Form Grease requires only a thin coating for utmost effectiveness. In fact, one gallon adequately covers approximately 200 square feet! And in addition — Globe Form is stainless, leaves a whiter smoother surface, and eliminates the need for painting.

Why not write for full particulars today? Once you use Globe Form Grease, you'll understand why engineers and contractors hail it as the "wonder grease" for concrete forms.

Write for interesting literature on "Rubarite", a sensational new synthetic rubber product for rubberized asphalt paving.

OILS *and* GREASES
for every purpose
DIESEL
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ALL NEW 36 H.P. Self-Propelled CONCRETE SAW

Now You Can "turn on a Dime"

with

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No Tilting
No Lifting

Raise the blade out of the cut... "Retract-A-Turn" casters automatically take over the load. Both rear wheels are raised clear of the pavement and the Clipper C-360 rolls easily in ANY direction.



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Specifications for any job—any aggregate — every saw—on 'green' or cured concrete.



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Reinforced abrasives cut 'green' concrete with widest possible range of HARD to SOFT Limestone Aggregates.



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Let your Factory-Trained Representative help you select the right Clipper Blade for your job.

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A "Must" when low-cost Abrasive Green-Con Blades are used. Adjusts for diminishing blade diameters. Allows full depth use of each blade. Protects Diamond Blades from bumping and scraping.

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It's Your Business . . .

A Warning:
Order Materials Well in Advance

SHORTAGES and slow deliveries of key construction materials are already in evidence though it'll be months before construction hits full stride in what should be its biggest year to date. Contractors who order materials well in advance and get commitments even farther ahead than they did last year will fare better in maintaining materials flow this year than less foresighted contractors.

Among the major critical materials from a supply and delivery standpoint are steel, glass, Douglas fir, plywood, and aluminum building sheets. A check of 22 cities in January reveals that these items are short—or deliveries are slow in several cities.

Other items, less of a problem now, but which could become more critical as the year gets underway, are cement, copper water tubing, vitrified clay sewer pipe, and southern pine lumber. The table (below) shows the supply-delivery situation for these materials in 22 cities as of January. The number of cities reporting shortages—or slow deliveries ranged from 14 for glass to three for cement.

The fact that there are shortages now when construction activity normally slacks off for the winter is evidence that some manufacturers and distributors are not able to build up supplies for the spring and summer demand. Furthermore, many are working off big backlogs of orders. This means that contractors who have not already secured commitments may find themselves unable to break into the supply lines for some items later on.

Glass Shortage Acute

Glass is currently the most widespread problem. Deliveries to Seattle are taking as long as four months. Cincinnati, Kansas City, and Denver report deliveries are indefinite. In New York, a major glass manufacturer is allocating shipments; its regular customers in the New York area are getting deliveries in from four to six weeks, but new customers may have to wait as long as six months.

Steel remains the problem it was in 1955. Structurals are the toughest items, but several cities report reinforcing bars and sheetpiling short. Plates are very tight. Structural shapes are short in Birmingham, Boston (had none in warehouse at time of January report), Chicago, Cincinnati, Dallas, Detroit, Minneapolis, New York, Philadelphia, and Pittsburgh. Dallas reports that promises for deliveries of structurals are now six to 12 months.

However, there's relief on the way for structurals. Shipments of fabricated structural steel are expected to rise 12% this year to 3,300,000 tons. That would be the largest volume for any year since 1929.

Bethlehem will bring "on the line" a 50% increase in capacity for rolling wide-flange and standard shapes—an increase of 800,000 tons per year. Inland Steel Co. expects to increase its output of structural shapes by 25%, and U.S. Steel is spending about $19 million to expand its structural facilities at Chicago and Pittsburgh.

The steel industry as a whole plans to spend a record $1.2 billion on new plant and equipment this year. This tremendous investment includes many firms, both big and small. With a 10-15% decline in auto needs anticipated, more steel should become available for construction and the manufacture of contractor products.

There are also shortages of other metal products used in construction. Aluminum building sheets are a problem in 13 of the 22 cities covered in the January check. Stainless steel sheets (not in the table) are short in several cities: Denver, Kansas City, New Orleans, and Montreal. Stocks are adequate but deliveries are slow in Birmingham, Chicago, Philadelphia, St. Louis, and Seattle. Main reason for the growing shortage of stainless is that nickel is very tight. Unless the government releases supplies from its stockpile, stainless steel sheets will become increasingly tougher to get.

Douglas fir lumber and plywood supplies are short and deliveries slow in several cities. The December floods in the Northwest caused a serious disruption of production and transportation. Furthermore, the heavy rains preceding the floods kept loggers out of the woods, and this may show up in lower mill receipts. According to a CM&E source, production of Douglas fir "cannot possibly be back to normal before April—and more probably it will be June."

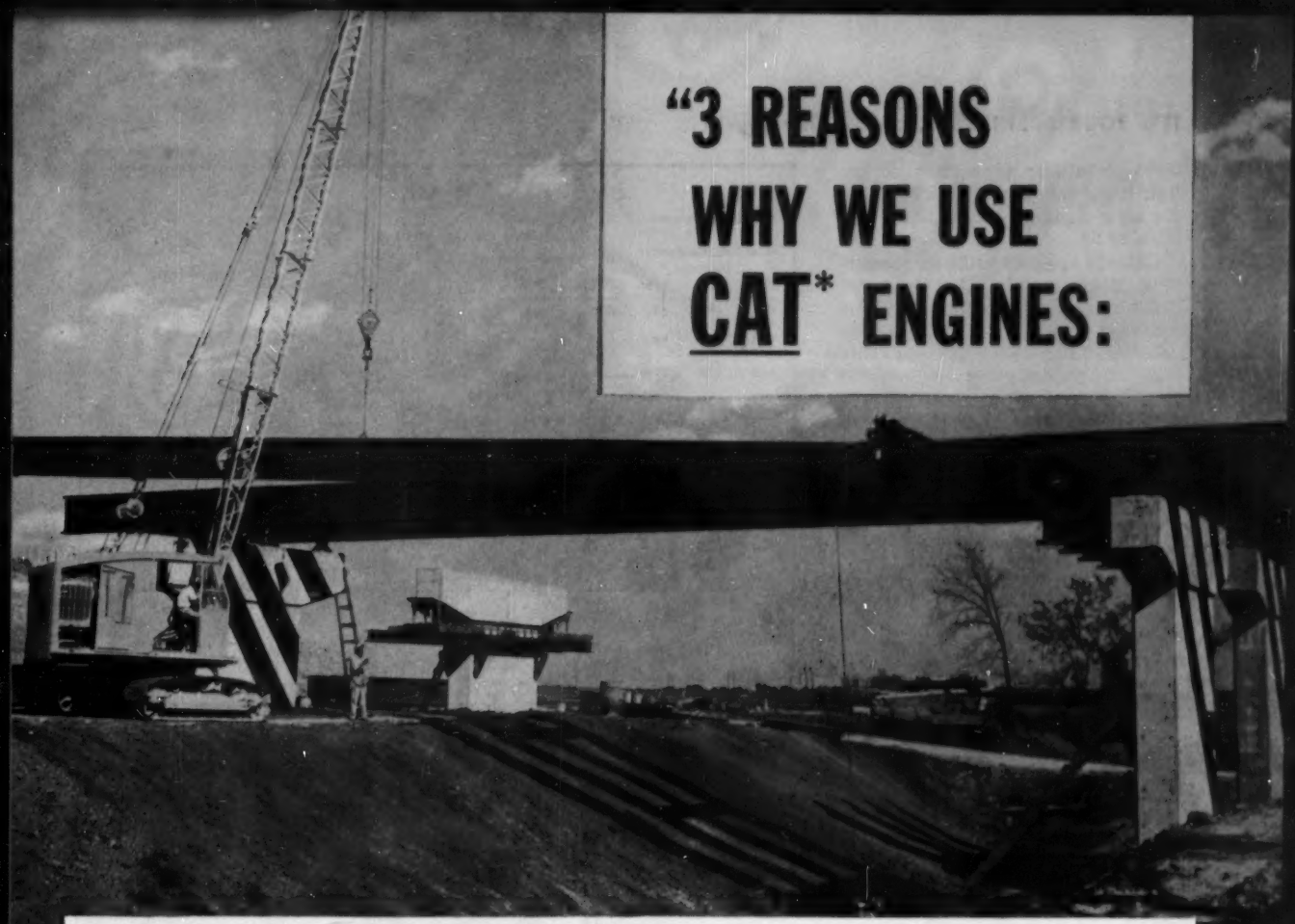
Because of washed-out roads, the cost of transporting lumber by roundabout routes has brought increases in prices in many cities in the last six weeks. Heavy fir timbers are in tight supply, and some mills will not even quote prices on

The Supply and Delivery Picture for Key Materials in 22 Cities

Key: Supplies—Sh=Shortage A=Adequate P=Plentiful
Deliveries—S/=Slower than normal N=Normal Im=Immediate Delivery Time is shown in Days

	STEEL			LUMBER		DOUGLAS		ALUMINUM	VIT CLAY
CITY	Structural Shapes Supply/ Delivery	Reinforcing Bars Supply/ Delivery	PORTLAND CEMENT Supply/ Delivery	Douglas Fir Supply/ Delivery	Southern Pine Supply/ Delivery	FIR PLYWOOD Supply/ Delivery	WINDOW GLASS Supply/ Delivery	SHEETS FLAT Supply/ Delivery	SEWER PIPE Supply/ Delivery
Atlanta			A/N 2-3		Sh/S1 28	A/ 1	Sh/S1 10-28		A/N 30-60
Baltimore	A-Sh/S1 30-60	A/S1 30-60	A/N 4-5	A/N	A/N 2	A/N 7	A/N 14-28	A/N 3-4	A/N 3-4
Birmingham	Sh/ 90	Sh/ 90	P/N 1	A/N 31-28	A/N 14	A/N 21-28	Sh/S1 30	A/S1 30-60	Sh/ 60+
Boston	None	A/ 1-2	P/N 1-6	Sh/ 7 14	P/ 2	Sh *	Sh/S1 14-42	Sh/ 90	P/ 1 3
Chicago	Sh/ 90-120	A/ sev wks	A	Sh/ 14-21	A/ 14-21	A/ 30		Sh/ Sev wks	A/1
Cincinnati	Sh/ 7-10	A/ 30-45	A/N 2	A/ 15-20	A/ 8-10	A	Sh/ Indef.	P/ 5-10	A/ 3-4
Cleveland	A/N 20	A/N 30	A/N 1-2	A	A	P/N 30		A/S1 7 10	A/N 3-4
Dallas	Sh/S1 150-360	A/N 7	A/N 1		P/N 14			A/N 10	P/N 7
Denver	A/ 90	A/ 90	A/N 1				Sh/Indef	Sh/ 90	A/ 15)
Detroit	Sh/S1 60	Sh/14	A/N	A/N	A/N		Sh/S1 60-90	Sh/ 90-120	Sh/S1 21 28
Kansas City	P/N 2	P/N 2	Sh/N 7	P/N 30	P/N 30	P/N 30	Sh/ Indef	Sh/90	Sh/ To mee
Los Angeles	P/N 1-5	P/N 1-5	A/N	P/N 1		P/N 1	P/N	P/N	P/N
Minneapolis	Sh/N 3	A/N 14-20	S/N	Sh/N 30	Sh/N 60	A/N	Sh/S1 60 90	A/N	A/N
New Orleans		Sh/S1	A/S1	Sh/S1	Sh/S1			Sh/S1	A/ 90-120
New York	Sh/N	A/S1 56	A/N	A-Sh/S1 90	A/S1 21 28	A-Sh/S1 42-56	Sh/ 28 up	A/N	
Philadelphia	Sh/90 up	Sh/ 90 up	A-Sh/N 3-4	A/ to 45	A/ to 45	A/N	Sh/S1	P/N 1	P/1
Pittsburgh	Sh/ 60	Sh/ 90	P/N 3-5	Sh/S1 30	P/N 5	Sh/S1 30	P/N 10	P/N 5-7	A/ 14-21
St. Louis	A/N 1-2	A/ 1-2	A/N 1-3	A/ 1 3	A/ 1-3	Sh/S1 14 up	Sh/S1 14+	A/S1 3 up	A/ 1-3
San Francisco	A/N 30	P/N 15	A/N	Sh/S1 30-45		P/N 21	Sh/S1 90	A/S1 30	A/S1 30+
Seattle	A/S1 60	A/S1 30-60	P/N 2	Sh/S1 30-45		A/F 7-21	Sh/S1 120	A/S1 90	A/S1 60-90
Montreal	Sh/ 90	Sh/90	A/N 2	P/ 3-7	P/ 3-7	P/ 7	A/ 7	Sh/S1 30	A/ 14
Toronto	Sh/S1 to 180	Sh/S1 42	P/N 1	Sh/S1 14-45	Sh/S1 14-45 Spruce	Sh/N 1 2 *Intense only	Sh/S1 21-28	Sh/S1	A/N 3-4 (24-36in.

"3 REASONS WHY WE USE CAT* ENGINES:





1 All the power we need to do the job easily.

2 Maximum dependability with minimum good care.

3 Operators prefer Cat power to work with."

NELSON ARMSTRONG, *Supt.*
Maxwell Bridge Co.

THOSE three reasons tell why Maxwell Bridge Co., of Columbus, Kansas, powers its cranes and excavators with Caterpillar Diesel Engines. The Koehring Crane shown here, placing I-beams for a bridge 5 miles west of Emporia, is one of 12 machines owned by Maxwell. Its engine? A Caterpillar D318, with well over 4000 hours on the meter.

Operators who have worked for this company from 8 to 25 years are particular about their power. Busy all year around, each man services his own machine. Naturally they want an engine that stays on the job without tinkering—and when they're asked to name their preference, they choose Caterpillar.

Most manufacturers of excavating equipment can supply Cat Diesels as original power. Or Caterpillar Dealers are ready to install these dependable engines as replacement power. A full line of engines is available. The D318, for example, is rated at 137 HP (maximum) at 2000 RPM.

For the power you need and for service and parts you can trust, call your Caterpillar Dealer. He's as near as your telephone.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

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MODERN HEAVY-DUTY DIESEL ENGINES

them. Southern pine supplies are tightening in a few cities, reflecting the slow deliveries and short supplies of fir.

Cement appears to be in reasonably good supply at this time, though this is largely due to the seasonal letdown in construction activity. However, Kansas City and Minneapolis report cement shortages, and Philadelphia supplies are fluctuating from adequate to short. Cleveland has no shortage now but expects one to crop out in the spring because some commercial builders are shifting to reinforced concrete construction to get around the tight supply of structural steel.

WHY CONTRACTORS FAIL

Source: Dun & Bradstreet

% of Total Contractor Failures			UNDERLYING CAUSES	APPARENT CAUSES	% of Total Contractor Failures		
1953	1954	1955			1953	1954	1955
49.3	49.8	45.7	Incompetence	Inadequate sales	29.7	31.6	30.7
				Heavy operating expenses	22.8	23.1	17.7
17.4	21.9	19.7	Unbalanced experience*	Competitive weakness	19.8	22.1	26.1
				Receivables difficulties	13.7	14.9	16.0
14.8	15.4	19.0	Lack of managerial experience	Excessive fixed assets	4.9	5.1	6.6
				Inventory difficulties	2.1	1.4	1.2
				Poor location	0.6	0.5	0.4
8.1	4.9	7.1	Lack of experience in the line of work	Other	7.3	6.3	9.0
				Poor health	2.0	2.7	2.4
4.7	4.4	5.3	Neglect	Bad habits	2.2	1.1	1.8
				Other	0.5	0.6	1.1
				Irregular disposal of assets	2.0	0.9	0.8
				False financial statement	0.2	0.4	0.3
2.5	1.8	1.4	Fraud	Premeditated overbuy	0.0	0.2	—
				Misleading name	0.1	0.1	0.1
				Other	0.2	0.2	0.2
				Strike	0.5	0.3	0.4
1.0	1.1	1.0	Disaster	Fire	0.0	0.2	0.1
				Employees' fraud	0.2	0.2	0.1
				Flood	0.0	0.1	0.1
				Other	0.3	0.3	0.3
2.2	0.7	0.8	Reason Unknown				

*Management's experience not well rounded in sales, finance, purchasing and production.

Failures Increase at a Slower Rate

CONTRACTOR FAILURES continued to rise in 1955 even though it was the biggest year on record in terms of the dollar volume of new contract awards and the total value of new construction put in place. However, the 8% increase in failures for the year was much less than the 27% jump in 1954.

During last year, 1,404 contractors went bankrupt, the largest number for any year since Dun & Bradstreet began compiling the figures in 1934. An analysis of

(Continued on page 215)

NOW! CMC TRANSCRETES®
Available in 4 Sizes!



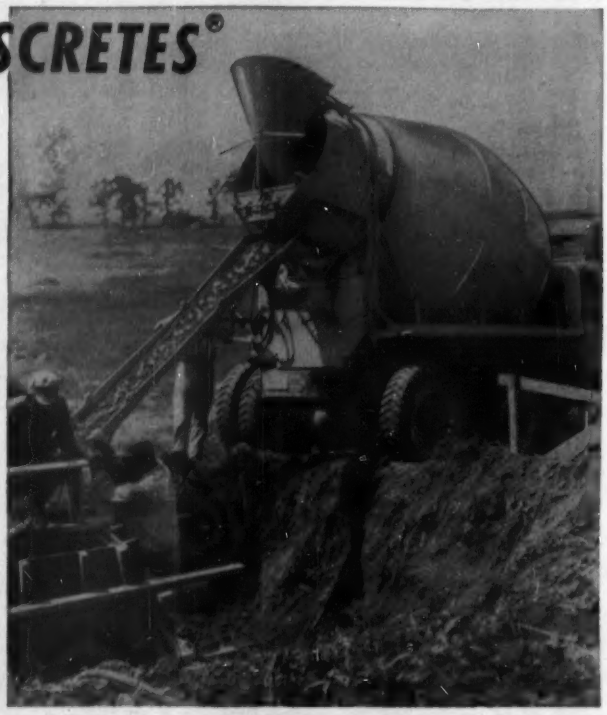
3½ to 7—yard mixing capacities (comparably larger as agitators).

Shorter over-all length for BIGGER LEGAL PAYLOADS.

● The new TRANSCRETES are America's only truck mixers with famous trouble-free CMC FLOATING DRIVE. They are faster charging — have more thorough mixing — quicker discharge on any type, any size job — anywhere.

Write for NEW, FREE Fully Illustrated TRANSCRETE BULLETIN

Construction Machinery Co., Waterloo, Iowa



NEW MODEL 700 above, hauls up to 8-plus yard loads, guaranteed to mix any 7-yard batch. 75" drum head, 16° slope for shorter over-all length, more favorable center of gravity, larger legal payloads. CONSTRUCTION MACHINERY CO., Waterloo, Iowa.

UNIT Model 510
Challenger
on-the-job



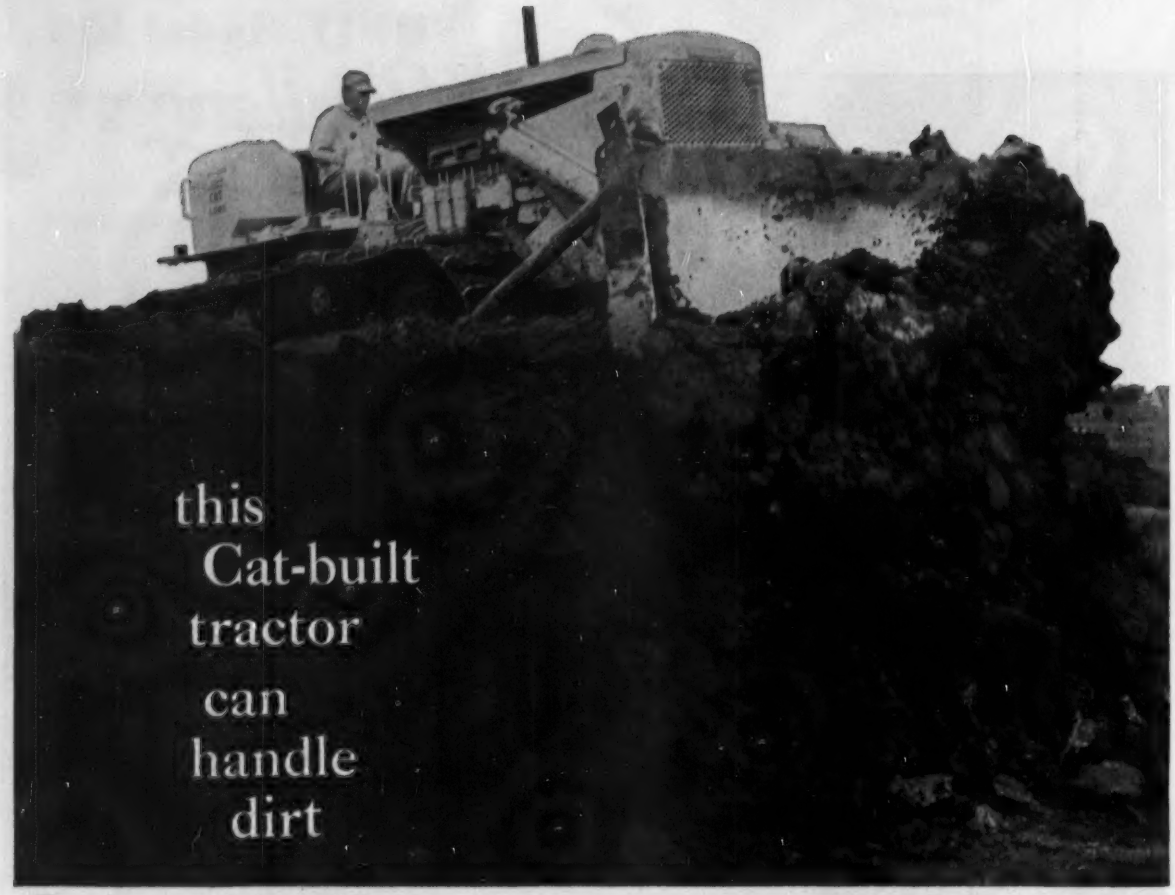
UNIT 3/8 yd. Trenchoe *"Pinch Hits"* for Crane on a Pipe Lifting Job

On pipe line construction jobs, the UNIT Challenger provides "Double Duty Performance" . . . It trenches . . . picks up pipe strung along the side . . . positions pipe for permanent installation . . . then backfills. UNIT Challenger is ideal because it has a full 360° swing . . . and the FULL VISION CAB gives unmatched visibility *on all sides.* It will pay you to investigate such UNIT features as **One-piece-cast main machinery case . . . Modern transmission design . . . Alloy steels and forgings . . . Involute splines . . . Force feed lubrication . . . Straight-in-line engine mounting . . . Hydraulic actuated clutches . . . Full floating, trunnion mounted taper drums . . . Torque Converter . . . Safety promoting Full Vision Cab** — and many other advanced features. Write for copy of Bulletin C-800.

UNIT CRANE & SHOVEL CORP.
6305 WEST BURNHAM STREET • MILWAUKEE 14, WISCONSIN, U.S.A.



SHOVELS • DRAGLINES • CLAMSHELLS • CRANES • TRENCHOES • MAGNETS



. . . with Caterpillar filter refills



Your Caterpillar dealer well knows the damage that dirt-laden oil can do to your tractor. Precision parts can be ruined in a matter of hours if unfiltered oil gets into the engine. That's why he always insists on giving you Caterpillar replacement filters. Built to meet the specific requirements of your engine by Purolator, they can handle all the volume your Cat-built tractor requires . . . they never let oil "by-pass" the filter . . . never let harmful abrasives enter the engine.

It's common sense to do as your Caterpillar dealer does . . . insist on Caterpillar filter refills. The life of your engine is at stake.

PUROLATOR

"FIRST IN THE FIELD OF FILTERING"

PUROLATOR PRODUCTS, INC., Rahway, New Jersey, and Toronto, Ontario, Canada

CATERPILLAR ANNOUNCES:

A NEW TRACTOR-MOUNTED RIPPER!

...TO SPEED UP SCRAPER LOADING
...KEEP EARTHMOVING COSTS DOWN



WHY TRACTOR-MOUNTED. With the tractor-mounted CAT* No. 8 Ripper, full weight of rear of tractor provides down pressure. No weights or ballast needed. With ripper beam raised, tractor is fully maneuverable. At end of ripping job, unit is fully available for bulldozing —with ripper instantly ready when needed again. When ripper teeth are swung up, drawbar is available for use.

WHY "LIVE DRIVE." Pump providing hydraulic power for ripper is driven directly from engine rear power take-off. This means ripper can be raised or lowered whenever engine is running, independent of tractor motion or flywheel clutch. Raise, hold, lower and float positions controlled by touch of operator on conveniently located lever. Hydraulic cylinders have enough force to lift rear of tractor off ground.

FEATURES

- **Strong, curved shanks of hardened alloy steel.**
- **Hardened steel points, quickly replaceable.**
- **Whole assembly mounted on heavy box-section beam.**
- **10-degree pivot of shanks to either side allows easy tractor steering.**
- **Individual shanks can be pinned up out of way, for single tooth ripping.**
- **Finger-tip operation of controls, easy handling.**
- **Total weight, hydraulic control and ripper: 6680 lb.**

Your Caterpillar Dealer can show you how this new ripper can increase production and profit for you by cutting scraper loading time. When you standardize on Cat-built equipment, you standardize on competent dealer service and Caterpillar parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

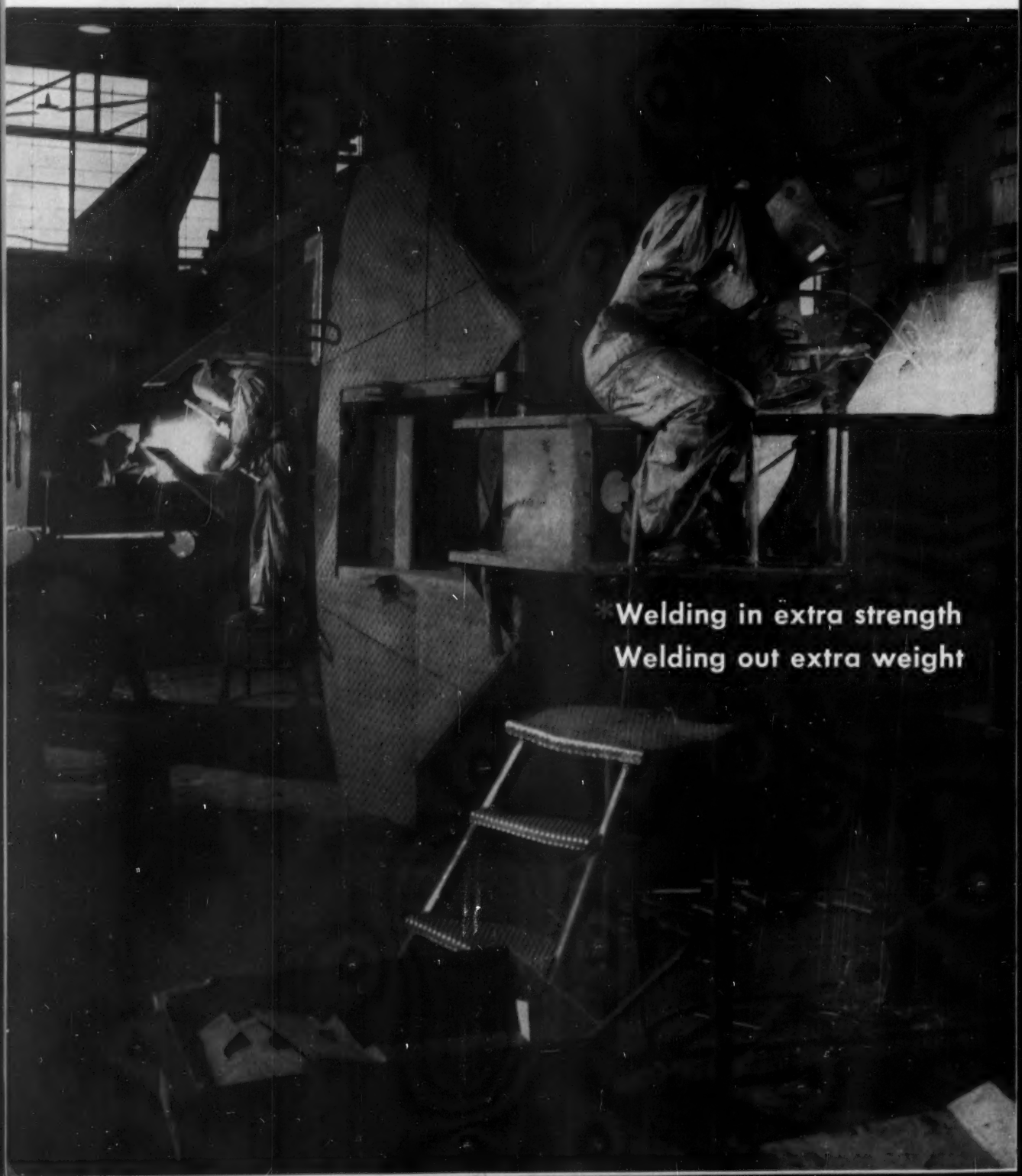
CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

NEW HEAVY-DUTY TRACTOR-MOUNTED RIPPERS

CATERPILLAR TRACTOR CO., Peoria, Illinois, U. S. A.
Please send me full information about the No. 8 Ripper.
*Name*_____
*Company*_____
*Address*_____
*City*_____ *Zone*____ *State*_____

what puts more guts in



P&H power shovels?

*ALL-WELDED CONSTRUCTION

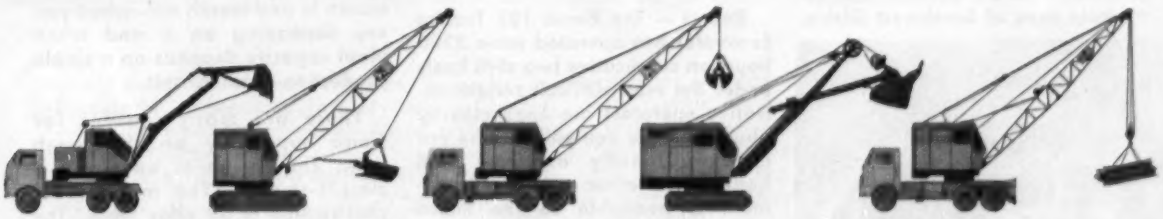
P&H engineers were first to discover that the way to put more guts in excavating equipment was to throw out old-fashioned methods and replace them with modern materials and processes.

That meant welding in extra strength. Getting rid of useless weight.

Castings that added useless weight were replaced with weldments of new, high tensile steels and rolled sections. Gussets, stiffeners and reinforcing plates were added for extra strength. Welding these into one rigid unit is the way P&H puts guts in every ounce of steel.

Years of actual service have proved the value of P&H modern engineering. Shovel users everywhere have demonstrated their acceptance by making P&H the largest manufacturer of power shovels and cranes in the business.

Your P&H dealer will be glad to point out, feature by feature, how P&H puts more guts in power cranes and shovels with all-welded construction. Also, in other ways. Harnischfeger Corporation, Milwaukee 46, Wisconsin.

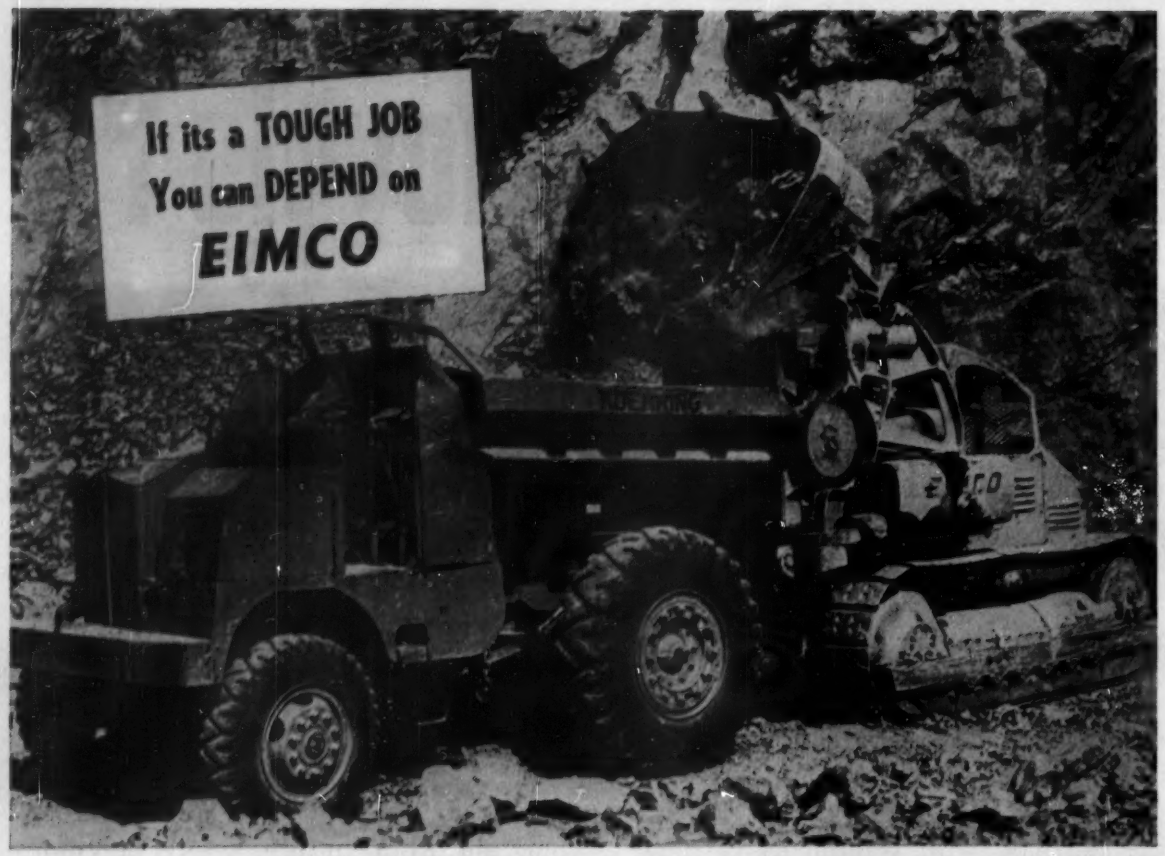


For Modern Engineering, Look to

HARNISCHFEGER

POWER CRANE and SHOVEL DIVISION





Hard, Rough, Tough Jobs Need Eimco Dependability

This case study concerns one Eimco 105 loader on which an open pit mine depends for its entire production.

Location — in an isolated and remote area of Southwest Africa.



Conditions — dusty, dry and hot. Pit floor uneven-solid rock.
Mining — selective
Operators — native
Maintenance — Nil

Report — The Eimco 105 Tractor Excavator has operated some 3200 hours on consecutive two shift basis under the most difficult conditions. Native operators are unnecessarily abusive of the equipment. The ore is exceptionally abrasive and heavy. No other loading equipment is available so the Eimco must stay on the job. One operator ran the 105 a complete shift without fan belts, both of them run the machine to the solid rock wall and spin the tracks when cleaning out an ore pocket.

Eimco does not recommend abuse on their tractor-excavators or any other equipment but Eimco produces a machine that can stay on the job day in and day out—month in and month out—when you are depending on it and when plant capacity depends on a single production loading unit.

There are many reasons for Eimco superiority on the tough jobs. The design of an Eimco is simple-strong. The material of construction is all alloy steel. The operating features make it the easiest tractor to operate and the most maneuverable. When you need guts in a tractor, compare an Eimco with anything you are using or have used previously.

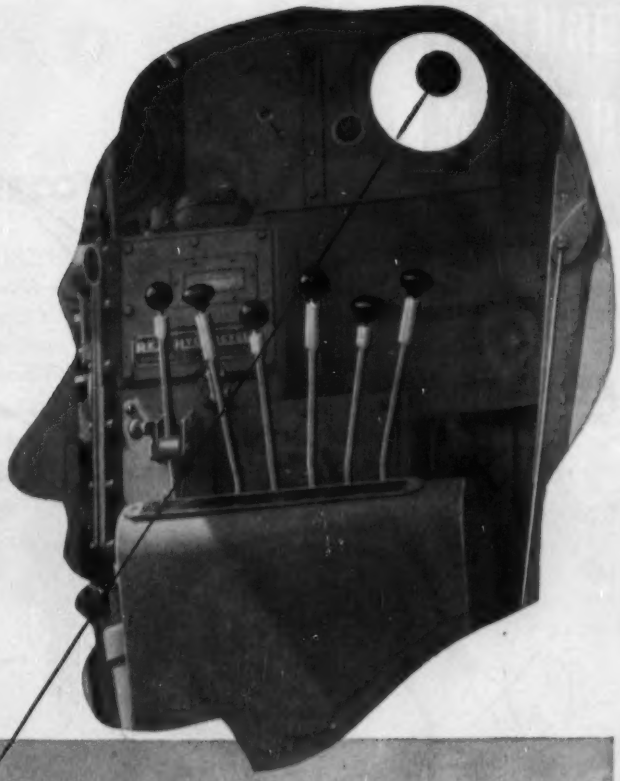
THE EIMCO CORPORATION

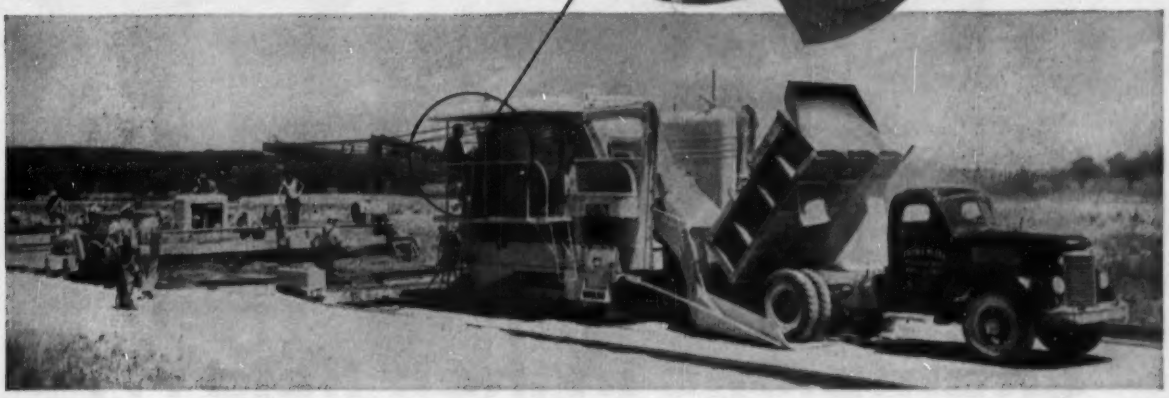
Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Kellogg, Ida. Baltimore, Md. Pittsburgh, Pa. Seattle, Wash. Pasadena, Calif. Houston, Texas Vancouver, B. C. London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa

B-173

Why you're always "yards" ahead with a REX® Paver



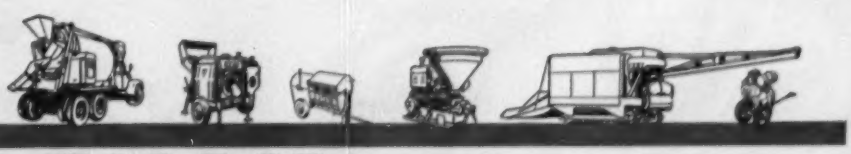


You'll finish "yards" ahead every day with a Rex... because the "hydraulic brain"—Hydrocycle Control—helps you pour more yards—faster! Hydrocycle saves you seconds every batch...you place more batches every day. That's dollars saved every day!

Hydrocycle takes over once the operator sets the batch meter...controls and operates the entire cycle. It eliminates the human element...cuts operator fatigue. There's no guesswork...no wasted seconds. The operator never has to leave his seat. He stays fresher...more relaxed...is able to give you the same high-speed operation at the end as well as at the start of the day. And he has far more time to perform the other paver functions—travel the bucket, swing the boom, spread the batch and move the paver. It's the big reason why Rex is the fastest paver in the business...makes more profit for you every day!

For all the facts, see your Rex Distributor or write CHAIN Belt Company, 4664 W. Greenfield Avenue, Milwaukee 1, Wis.

CONSTRUCTION REX MACHINERY

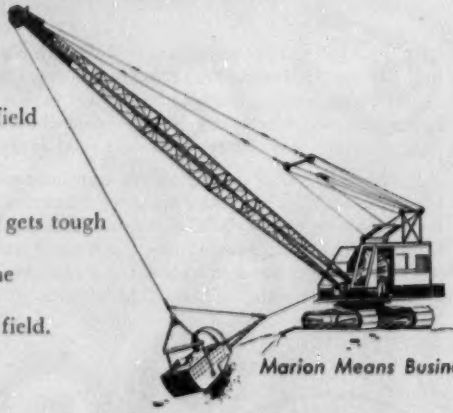


CHAIN BELT COMPANY



champions in their field . . .

Point! Flush! Retrieve! You thrill to the brilliant field work of an experienced Irish Setter. A glance tells you his sure-footed poise and his stamina when the going gets tough are the marks of a true champion. You'll recognize these same qualities in Marion's one-yard 43-M, a champion in its field.



Marion Means Business

MARION POWER SHOVEL COMPANY, MARION, OHIO

PICTURE OF THE MONTH
CONSTRUCTION METHODS AND EQUIPMENT

The Gap Narrows

SUPERSTRUCTURE of the 21,343-ft long Richmond-San Rafael Bridge across the north arm of San Francisco Bay now is well over 90% completed. Here American stiffleg travelers start to erect the final anchor arm and complete the cantilever span. Superstructure contractor is Judson-Pacific-Murphy-Kiewit, a joint venture of Judson Pacific Murphy Corp. and Peter Kiewit Sons' Co. Completion of the superstructure officially is scheduled for August.



revolutionary new concept . . .

. . . a COMPLETE UNIT

before you consider any new mixer, think what these features will mean to your business

1 single frame construction

No more costly "fighting" between mixer frame and truck frame.

2 power from FRONT of truck engine

The Smith "INTEGRAL" uses the truck engine. Power is taken off *ahead* of the truck clutch. Regardless of truck clutching or gear shifting, *the mixer continues to run.* This is a big advantage for stop-and-go driving, paving and curb and gutter jobs.

3 standard trucks with manufacturer's warranty

Take your choice of most standard trucks. The front power take-off and integral frame design are approved and warranted by the truck companies.

4 1100 pounds less weight

With no engine and no mixer frame, the Smith "INTEGRAL" cuts overall weight by 1100 pounds per unit. *Yet not one ounce of structural strength is sacrificed.*

5 better weight distribution

The Smith "INTEGRAL" is 7" shorter than comparable size Smith mixers with separate engine drive. Because the mixer is lighter and the center of gravity closer to the front, bigger legal payloads can be carried or shorter trucks can be used.

6 much less maintenance cost

You have only one engine to service — not two. Six cylinders instead of 12 to take care of. Experience has proven that there is little or no increase in maintenance on the truck engine and that costly maintenance of the mixer engine is completely eliminated.

7 much less fuel consumption

Careful records kept by operators for a year of job tests prove that *the Smith "INTEGRAL" can save more than $40 per month on gas and oil alone,* compared to fuel costs on separate engine drives.

8 much more stability

There is no mounting strip on the Smith "INTEGRAL". The mixer is tied directly to and set lower in the truck frame. Valuable inches of headroom are saved and there is much less chance of tip-over.

The T. L. Smith Company presents the revolutionary new "INTEGRAL" with a great deal of pride. First to conceive and build a truck mixer unit which *uses the truck frame as the mixer frame and takes the power from the front of the truck engine crankshaft,* Smith engineers consider the "INTEGRAL" their finest contribution to the industry in more than 55 years of "firsts."



SMITH

T. L. SMITH CO. MILWAUKEE

int

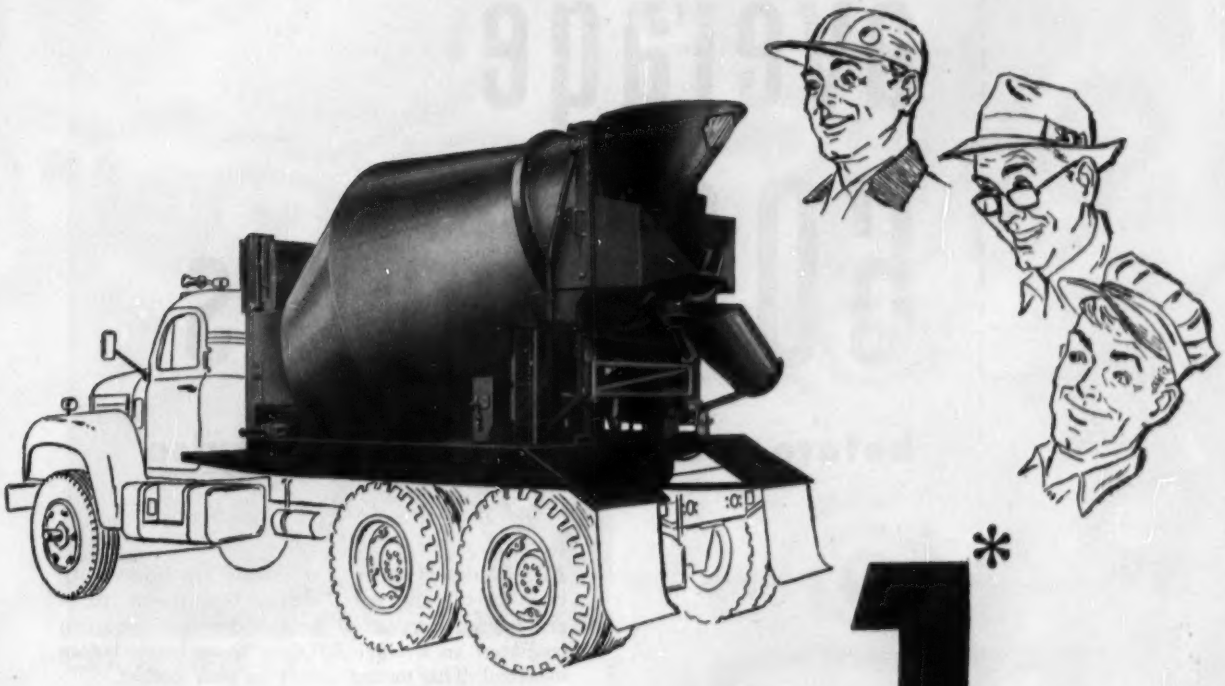
ONE FRAME FOR BOTH TRUCK

the "INTEGRAL" is all new . . . yet thoroughly job-tested

This great new Smith "INTEGRAL" mixer offers you a combination designed by Smith exclusively for the ready-mix industry. The "INTEGRAL" becomes a component part of your truck, making *one* solid, dependable, long-lasting unit.

But new as it is, the Smith "INTEGRAL" was not

designed for the ready-mix industry



egral*

AND MIXER — ONE ENGINE FOR BOTH

readied for you until it was tested, refined, and perfected. 88 units have been produced to test the front engine principles and design. 101 integrally mounted Smiths are working in the field today. All of these mixers have been job-tested in various sections of the country for as much as two years, to prove conclusively that this is the finest truck mixer ever developed for the ready-mix industry.

Here, for the first time, is a composite of a mixer and standard truck which is designed specifically for the ready-mix industry.

* Trademark

THE T. L. SMITH COMPANY, 2889 North 32nd Street, Milwaukee 10, Wis.

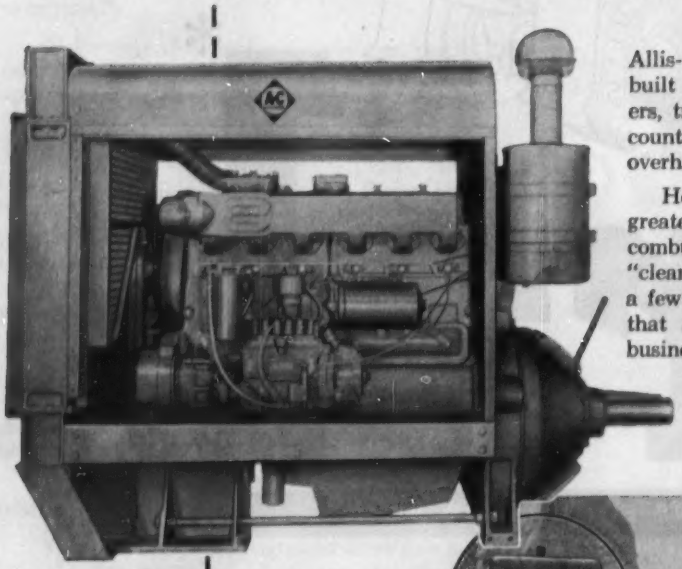
Affiliated with Essick Manufacturing Company, Los Angeles, Calif.

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ALLIS-CHALMERS DIESELS

average 6000 hours

before overhaul in toughest service



Allis-Chalmers dyna-swirl diesels are heavy-duty built for the long run. Whether they power crushers, trucks, scrapers, shovels or dozers — you can count on an average 6,000 or more hours before overhaul. This means money in your pocket.

Heavy-duty construction . . . 10 to 17 percent greater displacement . . . controlled turbulence combustion resulting in lower peak pressures . . . "clean" simple design with fewer parts are only a few Allis-Chalmers dyna-swirl diesel advantages that make them the longest-life engines in the business.

Ask your nearby Buda Division Distributor to prove the superiority of these engines. There's no obligation. Write for illustrated bulletin and data.

ALLIS-CHALMERS, BUDA DIVISION, MILWAUKEE 1, WISCONSIN



6DA-844 diesel engine powering Telsmith Crusher

8C-35

ALLIS-CHALMERS

Construction News in Pictures . . .



CRANE LIFTS CRANE

A 25-ton Lorain crane hoists a 20-ton Lorain to the roof to handle steel erection for the construction of additional floors. The rooftop crane is placed on one of two pairs of 3x24-ft runways bolted to the roof girders (right). The crane moves over the roof by picking up one pair of the runways, placing it ahead, then moving onto it. Contractor is Builders Structural Corp. of Cleveland.





DOZER BOASTS LONG REACH

Blue clay at Grass River Lock on the St. Lawrence Seaway Project is so soft it will not support wagons in the spoil area where it is dumped. So Dutcher Construction Corp., Queenstown, Md., uses a dozer with a reach of 32 ft 4 in. from the trunnions to the face of the blade to pile wagon-dumped clay into higher spoil banks than would be possible with an ordinary dozer blade. The assembly is welded onto the "C" frame group of a Caterpillar D-9. Dutcher holds a $2.2 million contract for excavation at Grass River Lock.

Continued on page 42



F-100 8-ft. Pickup—GVW 5,000 lbs.

T-800—GVW 42,000 lbs.; GCW 65,000 lbs.

FORD BIG JOBS can mean

FORD EXPERIENCE IN HEAVY DUTY ENGINES PAYS OFF . . .

- **Much longer peak engine performance!**
- **Much less DOWN TIME on the job!**

Ford Trucks for '56 save you money right from the start. And, they keep on saving with their extra-sturdy, long-life engine design.

For instance . . . Ford Engineers have now introduced into all heavy-duty engines the greatest valve advancements ever. As an example, see the exhaust valve in diagram on right page. The valve stem is hollow and partially filled with powdered sodium. When the sodium gets hot, it *turns into a liquid.* As it moves up and down, it carries heat away from valve head—*allows it to operate up to 225° cooler!* Result: a cleaner-running, more burn-free, longer-lived valve face.

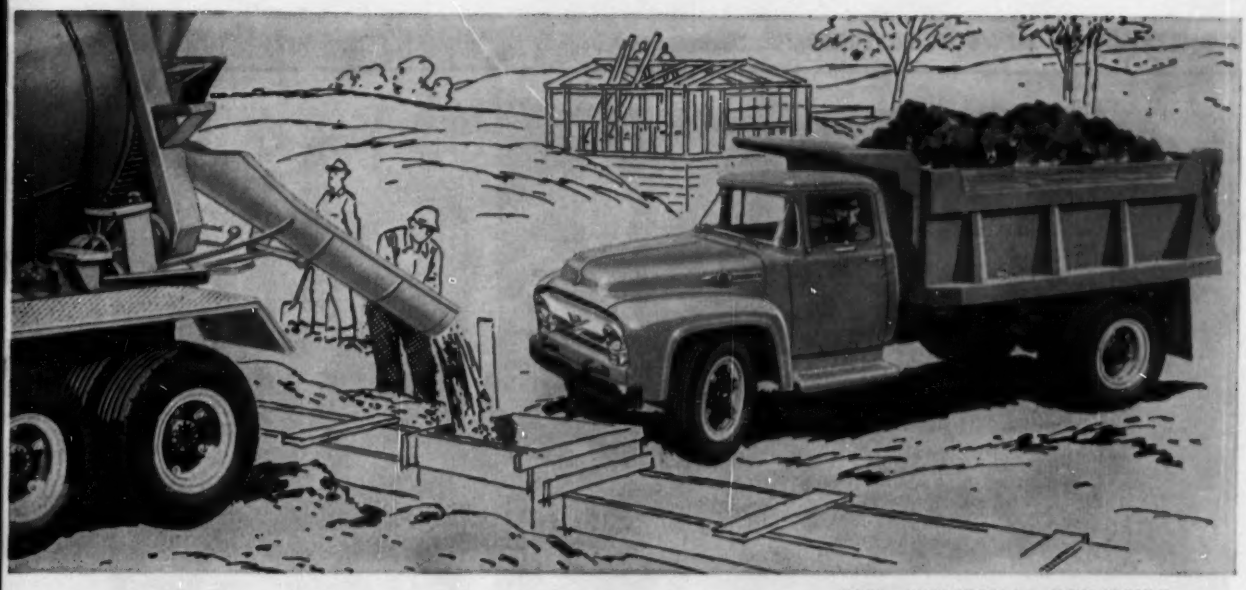
Ford's long-lasting engine design pays off for you in every way. You save money on parts replacements such as piston rings and bearings. You save on shop labor—extend time between preventive maintenance jobs like valve adjustments, valve grindings, compression tests, ring jobs and the like.

And you can save on driver costs if you can keep trucks out of the shop and on the road. Yes, you save in every way when you get more work done per truck!

There's a Ford Truck for every trucking job. Before you buy your next truck, Test Drive a Ford Economy Truck.

FORD TRUCKS LAST LONGER

Certified by independent insurance actuaries for the ninth consecutive year! Studies of over 10,068,600 current license registrations show that Ford Trucks last up to 9.9% longer than any of the other 4 leading truck makes!



F-900—GVW 29,000 lbs.; GCW 60,000 lbs.

BIG SAVINGS in your business

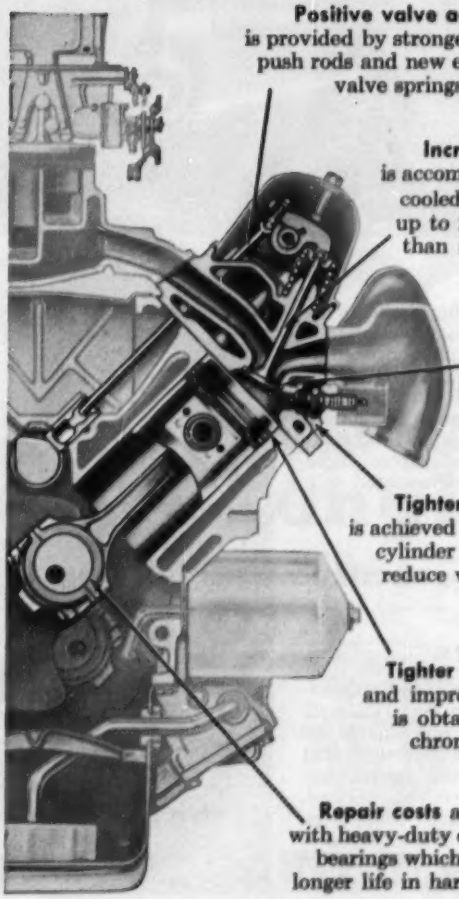
Hauls up to 3000 lbs. more than other 6-wheelers—New Ford T-800

● New power and hauling capacity of the Ford Tandem BIG JOB cuts hauling time on every run—makes giant cargos seem lightweight. You have a choice of two gas-saving Short Stroke engines. Either the 190-h.p. *Torque King* Y-8 or, the 200-h.p. *Torque King* Special Y-8.

You have new engine advancements for longer life (some explained and illustrated at the right).

New high-capacity tubeless tires, heavy-duty 5-speed transmission and Power Steering are standard equipment, at no extra cost. Two 3-speed auxiliary transmissions and full-air brakes are available at low extra cost.

New *Driverized* Cabs for driving comfort and convenience have *Lifeguard* Design safety features found in no other truck. Lifeguard steering wheel helps protect driver from steering column; Lifeguard door latches help keep doors from jarring open in case of accident.



Positive valve action is provided by stronger, tubular push rods and new equal-coil valve springs.

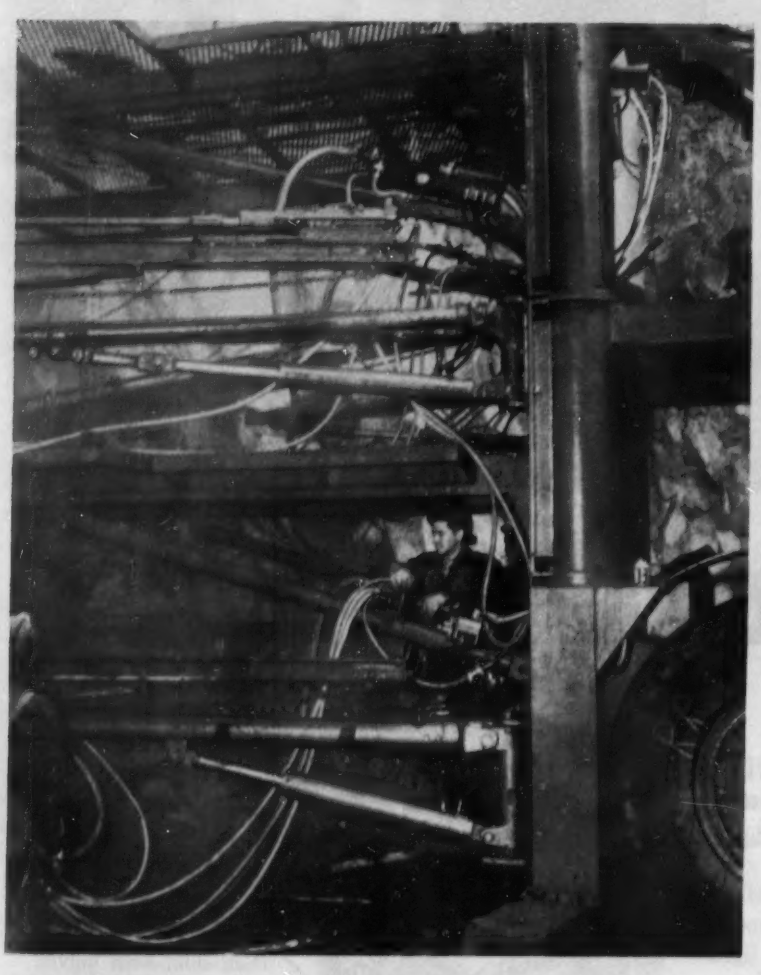
Increased valve life is accomplished with sodium-cooled exhaust valves—up to 225° cooler-running than solid-stem valves.

Longer valve and seat life are the result of solid tungsten-cobalt alloy facings and exhaust valve seat inserts.

Tighter valve closing is achieved with stress-relieved cylinder heads that help reduce valve distortion.

Tighter compression seal and improved ring durability is obtained with thicker chrome-plated rings.

Repair costs are lower with heavy-duty copper-lead bearings which provide longer life in hard service.



FAST WORKER

Engineers claim this big rig drills into rock eight times faster than conventional drills. Frank Gibson and William Roberts of Spokane, Wash., designed it for tunnel work at Mayfield Dam in Washington. The jumbo carries six hydraulically controlled air drills that operate from three works platforms. It is mounted on a Euclid truck chassis.

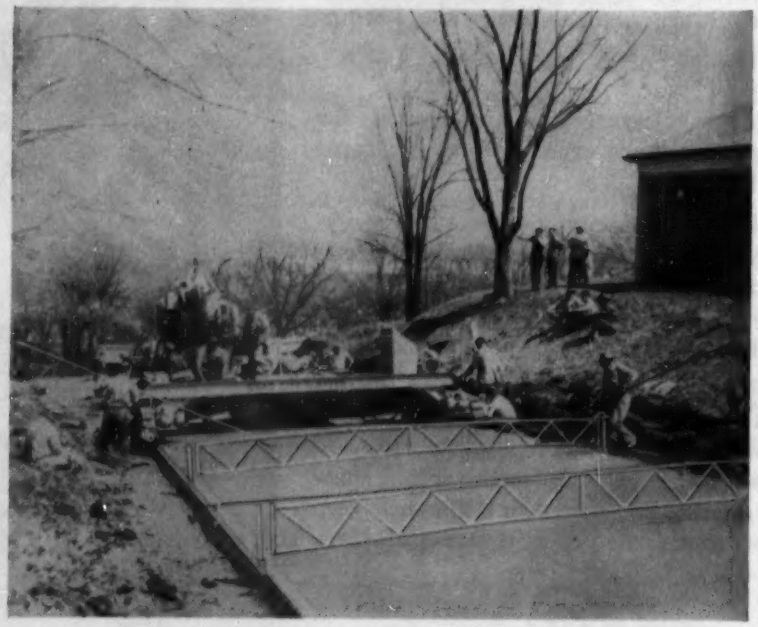


MIDGET CRANE

Equipped with a ¼-yd dragline, this miniature crane is proving a good tool for ditch digging and other small jobs. It is built on a cross-frame and balanced by a 4,000-lb block of concrete when working. In tests it is moving an average of 50 tons of earth an hour. It was designed as a backyard project by Allen Trask, a Wilmington, N. C., farmer.

MONEY SAVER

Slipform paver, developed by Quad-City Construction Co., it is claimed, cuts paving costs as much as $5,000 per mile. It is a crawler-mounted unit with 10-in. wide tracks, but there are no track rollers. Instead, a set of rollers is spaced every 6 in. on each track link. The slipform is a 22-ft H-beam with rails built in to ride on the track rollers.



new

DESIGNED AND BUILT IN THE SAME WORKSHOPS AS THE WORLD FAMOUS SAPPHIRE JET AERO ENGINES



The latest addition to the

ARMSTRONG SIDDELEY

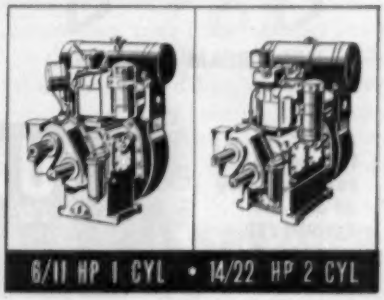
range of

DIESEL AIR COOLED engines

The outstanding 20-33 h.p. 3-cylinder model

Air cooled for simplicity and reliability. Light weight—highly efficient in all climates—low fuel consumption. All parts accessible and maintenance costs low—minimum dimensions.

Armstrong Siddeley diesel power units are fitted by leading manufacturers of equipment for agriculture, industry, and marine use, including: Atlas Diesel Ltd., Aveling-Barford Ltd., B.T.H. Ltd., International Harvester Co. of Gt. Britain Ltd., Massey-Harris-Ferguson Ltd., Parsons Engineering Co. Ltd., Ransomes, Sims & Jefferies Ltd. From 6-33 h.p., one, two, three cylinders—most parts interchangeable.

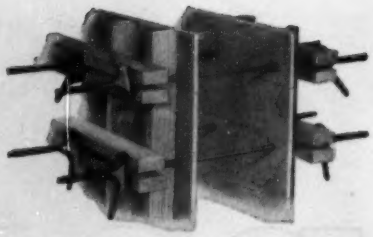


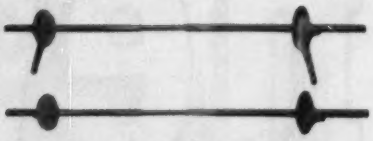
6/11 HP 1 CYL • 14/22 HP 2 CYL

ARMSTRONG SIDDELEY MOTORS LIMITED
PARKSIDE . COVENTRY . ENGLAND
MEMBERS OF THE HAWKER SIDDELEY GROUP

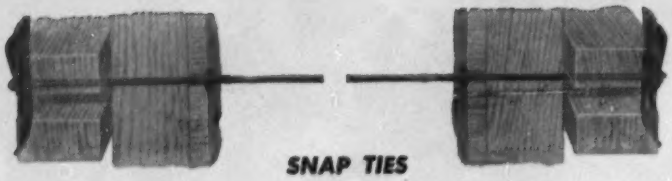
SUPERIOR

All the Accessories For Dependable Concrete Forming!





TILT LOCK CLAMPS



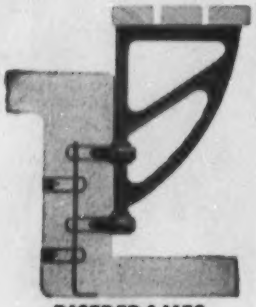
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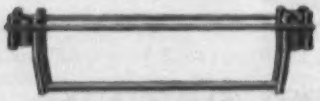
STANDARD HANGER FRAMES



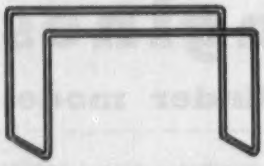
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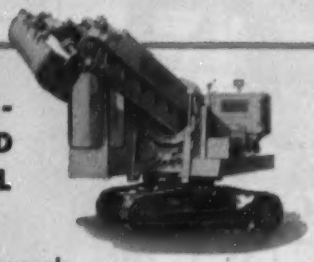
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FEBRUARY, 1956

VOLUME 38 • NUMBER 2

HENRY T. PEREZ, Editor

CONSTRUCTION METHODS AND EQUIPMENT

A Court Speaks

IN AN OPINION in the case of Terminal Construction Corp. vs Bergen County, Justice Albert E. Burling of the New Jersey Supreme Court delivered some forceful words worth heeding. Speaking for the majority of the court, he summed up the legal positions of contractor and owner thus:

"As is customary in a major enterprise such as this (a large sewer job), detailed and meticulous specifications of terms form part of the contract. Such provisions are usually recommended and drafted by an experienced engineer at the instance of the owner or sponsor of the project.

"The work to be performed is grounded in the principles of free enterprise and competition. The scope of such an undertaking requires those who accept the invitations to bid to be well versed or advised in contract law and forms, together with comparable efficiency in accounting and engineering departments. Otherwise their financial doom is spelled. It is common knowledge that the owner or sponsor 'writes his own ticket' and the competing market of contractors is obliged to bid and perform in conformity thereto, or to avoid that field of endeavor.

"However, this does not mean that a contractor is not entitled to enjoy just treatment within the terms of the contract. If it were otherwise, the construction of vital public and municipal projects would suffer by the failure of qualified bidders to enter the field for fear of risks that are beyond the foreseeable. It is grave enough to meet calculated risks in good business practice. The public authority which chooses the contract terms is not exempt from the operation of the basic principle of the construction of contracts: That when ambiguities exist they are to be taken most strongly against the draftsman."

All this is highly gratifying. It rightly places—on the owner—the responsibility for improperly drawn contracts. Yet this does not relieve the contractor from the necessity of seeking competent legal advice when in doubt about contract provisions or interpretation of the plans and specifications.

Many a contractor has found to his dismay that he was an excellent construction man, but a lousy lawyer. And he has wound up in no better financial position than the incompetent contractor who retained a good lawyer. A person who would not dream of trying to solve his own medical problems without consulting a doctor, too often will try to solve legal problems without a lawyer.

Often the legal problem is built into the specifications. Probably the most troublesome item that keeps recurring is the exasperating "or as directed by the engineer." It usually is nothing more than weaseling by a specification writer who wants to make sure—and make sure the easy way—that he has not overlooked something.

Fortunately, this wording is beginning to disappear—albeit slowly. Bureau of Public Roads Deputy Commissioner A. C. Clark noted in remarks about the new federal highway specifications now being prepared:

"There is a trend toward elimination of the phrase 'or as directed by the engineer' in favor of more definite performance specifications. This permits the contractor to utilize any type of equipment. This is very noticeable in earth compaction specifications where the contractor can now utilize any one of several types of equipment as long as he meets specified compaction standards.

"Initiative is also being taken by the Bureau of Public Roads in cooperation with the states in bringing up to date state specifications to eliminate restrictive provisions and obsolete methods and to thereby allow the contractor more latitude in the prosecution of the work."

Modernization of specifications and elimination of ambiguities cannot come too soon. In an expanded highway program such contract improvements will be specially valuable. For, according to H. A. Radzikowski of the Bureau of Public Roads, "Highway needs studies disclose that $30 billion of the $101 billion highway needs found to exist over a 10-yr period will be for the purpose of earthmoving."

Any measures that free the contractor from restrictions on devising new and better methods of prosecuting his work are to be applauded. Yet it must be remembered that contract modernization does not relieve the contractor from the necessity for proper performance. Nor does it make retention of competent legal counsel any less vital.

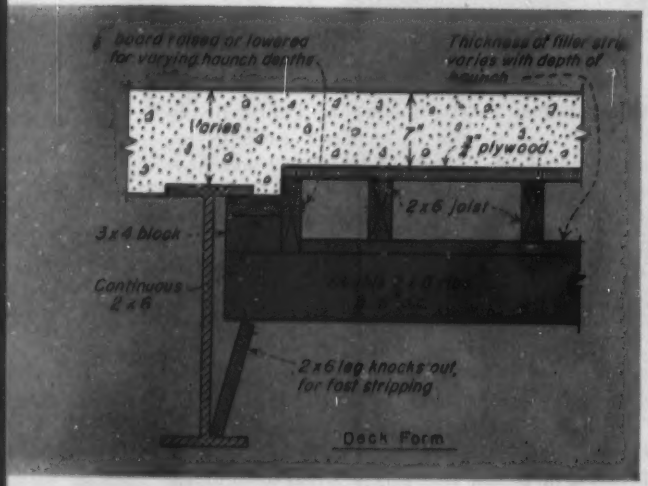
Good Forming and Finishing Ideas

- **Deck Forms**
  Easy to erect, adjust, and strip
- **Parapet Forms**
  Rigid steel yokes replace ties and braces
- **Vibrating Screed**
  Simple, lightweight, and portable
- **Stripping Scaffold**
  Platform cantilevers in two directions

A BATCH of new deck paving techniques is paying off on a big elevated highway job in Jersey City, N. J. Forming is fast and simple, a team of paving rigs is highly flexible, and stripping crews work from tricky scaffolds.

Most of the credit goes to John Sorensen, superintendent for Brookfield Construction Co. of New York. Sorensen is paving a 3-mi elevated section of the six-lane Hudson County Extension of the New Jersey Turnpike. He has

Deck Forms—Easy to Erect, Adjust, and Strip



SIMPLE FORMWORK is standard for nearly all areas of deck. Only filler strip has to be changed. Carpenters determine thickness of strip by leveling over from survey points on top of flange.

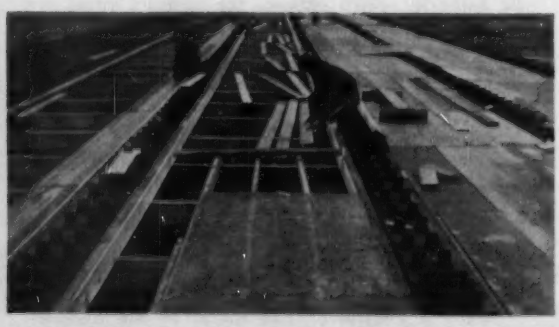
HAUNCHES that vary in depth from 1 to 3 in. pose the major problem on deck forms. Normally, they would seriously limit both mass production and standardization of form pieces. But the contractor designed a form that requires adjusting of only two pieces—a filler strip on cross ribs and a ⅞-in. board that forms the side of the haunch. Depth of haunch determines thickness of the filler and also position of the board. All other pieces are standard throughout the job.

Erection is simple. Workmen first place a 2x6 under the top flange of the stringer to form the base of the haunch. These 2x6's are held in place by the ribs, which are supported at each end by 2x6 legs. The ⅞-in. board then is nailed to the 2x6 under the flange. Carpenters determine its elevation by leveling over from a marked point on the top of the flange. Then, by measuring from the top of the board to the rib, they easily determine the filler strip thickness. Final operation is placing joists and plywood.

The form is stripped by simply knocking out the 2x6 legs. There are no wires to snip or hangers to remove. Forms are reused about six times.



RIBS SPANNING about 8 ft between stringers are supported by 2x6 legs wedged against the bottom flanges. Because stringers are identical, form pieces fit anywhere on the job.



PLYWOOD PANELS are laid over joists. Side of haunch is formed with ⅞-in. board nailed to continuous 2x6 wedged under top flange by blocks on ends of ribs. Continuous 2x6 forms base of haunch.

Simplify Deck Paving

By ALBERT C. SMITH,
Associate Editor

two main problems. First, a wide range of haunch depths hampers mass production of form pieces. And second, frequent jumping of paving operations demands flexible and portable equipment.

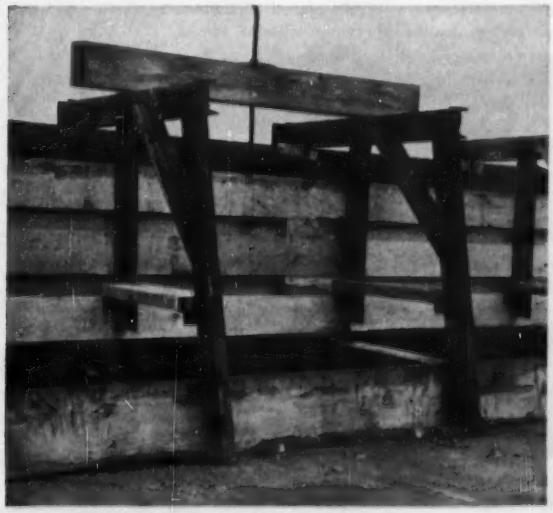
Despite the variation in haunches, Sorensen has standardized on one deck form for practically the entire job. Only filler strips on cross ribs have to be changed. One board has to be adjusted up and down, but it can be used anywhere.

Flexibility of paving teams is solved by using only rigs that can be transported by hand or by power buggy. Frequent jumping is required because a shortage of steel expansion joints prevents uninterrupted paving in any direction. Besides, the only access to the deck is at the ramps near the center of the job. This means that the contractor works in two directions and in four areas. He paves in a different area each day.

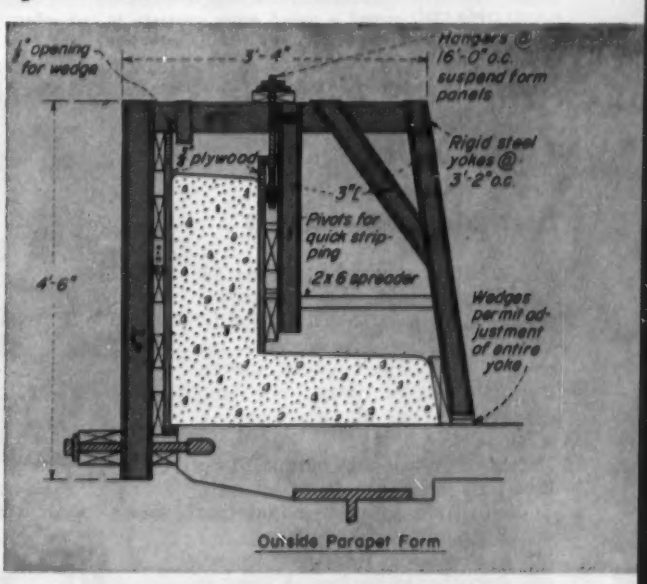
Material handling was a problem at the beginning of the job because trucks could not get up on the deck. Until the job was 25% complete, cranes hoisted all materials from the ground. But now access ramps are paved, and trucks hauled close to pours.

During the winter, Sorensen makes only two or three 300-yd pours a week with a crew of about 200 men. When the warmer weather arrives, he will double his crew and get probably six pours a week.

Parapet Forms—Rigid Yokes Replace Ties and Braces



STEEL YOKES support outside parapet form. One end of inside wood panel is hung from hanger and other end meshes with end of adjacent panel. Contractor will get 40 reuses from form.

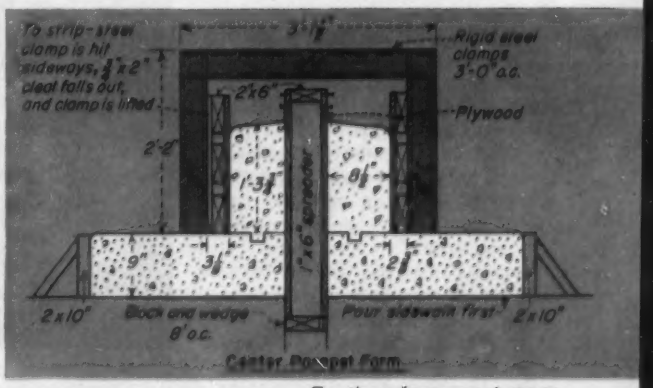


STEEL CHANNELS welded into rigid yokes save time and money on forms for both outside and center parapets. They go up fast, eliminate ties and braces, offer precise control of line and grade, strip easily, and can be reused indefinitely.

On the outside parapet, one team bolts yokes to the edge of the deck while another places outside panels of wood against the outer leg of the yoke. The base of panels rests on walers and the top is held against the leg by a wedge.

Inside panels are supported at one end by the adjacent panel and at the other end by a hanger. To brace the inside panels, a pivoting angle is wedged against them with a spreader.

On the center parapets, U-shaped steel clamps erect quickly, and strip by simply knocking sideways.



Continued on next page



HAND-OPERATED screed is pulled across concrete as end rollers ride on rails. Contractor has to add steel gooseneck at each end to connect screed with rails placed high above projecting parapet reinforcing. Engine at center vibrates screed.

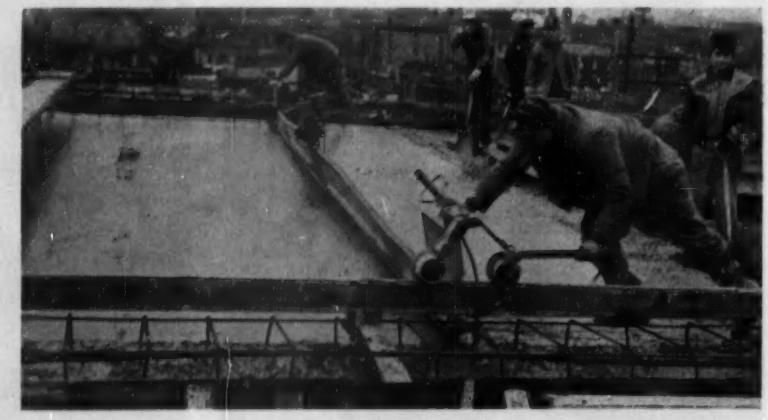
Vibrating Screed— Lightweight, Simple, Portable

ALUMINUM vibrating screeds 36 ft long have many advantages on the big deck job. They weigh only 800 lb, and are transported by power buggy. Two types of Master screeds are required, one for crowned and one for superelevated sections.

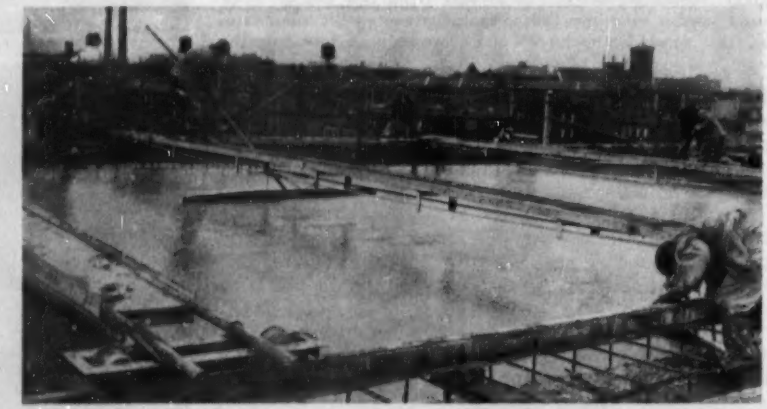
Their operation is simple. Two men pull them over fresh concrete in 4 to 6-ft jumps. A gasoline engine mounted at the center vibrates the mix as the screed shapes and smooths the surface. A lever at each end raises the screed above the concrete for moving backward.

Big advantage is the simple screed rail. Instead of conventional steel beams supported by heavy pipes and timbers, Brookfield needs only an angle-covered 3x4 supported on double bolt assemblies spaced 7 ft apart on stringers. Bolts are threaded to provide precise leveling.

Screeds also pay off on transition sections of deck. In areas where the deck fans out up to 60 ft, Brookfield simply places a pipe-type rail at the 36-ft line and operates two screeds side by side.



END LEVERS raise screed off concrete when moving backward to get second pass. Simple rail is supported by threaded bolt assemblies. Lightweight screed is transported by buggy.



FINISHING BRIDGES ride on rails behind screed. Pipe mounting at ends provides easy two-way adjustment. Turnbuckles also adjust at center. Rigs are transported by hand.

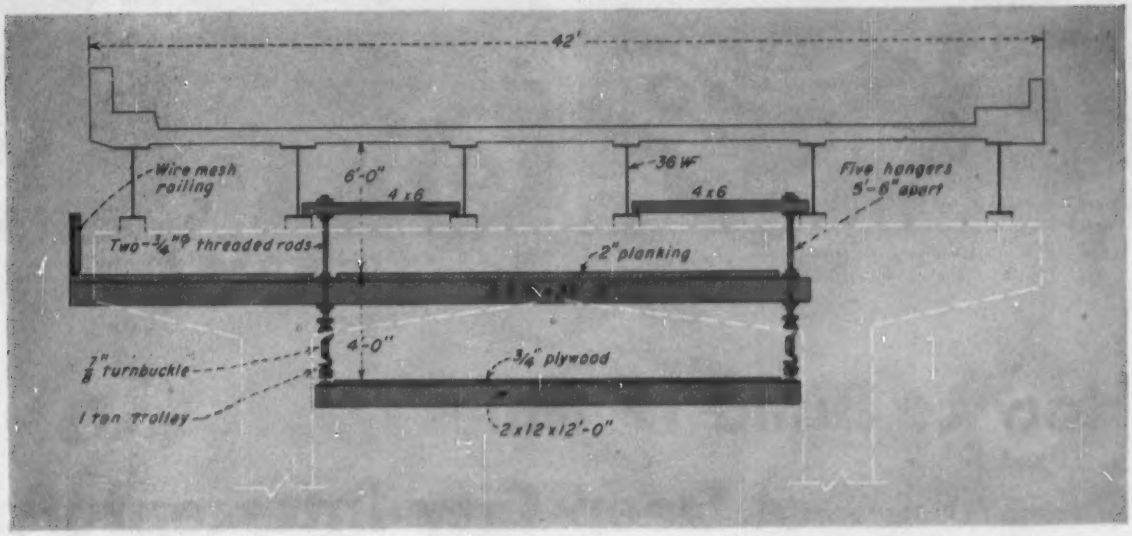




Buggy Handling

FLEETS of Whiteman power buggies do a fast job of placing concrete. They load at ready-mix trucks, and then race over movable catwalks to the pour. Because the contractor can work at four different areas of the deck, ready-mix trucks are seldom more than 300 ft from a pour. They also pull trailers of forms, lumber, and accessories.

Stripping Scaffold—Upper Platform Cantilevers Both Ways



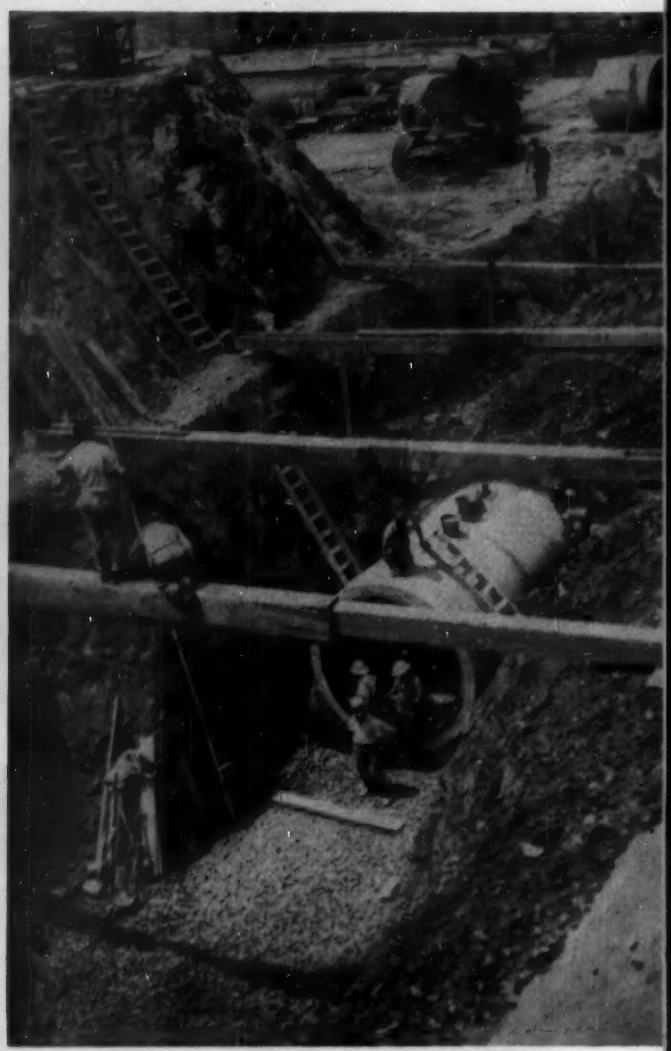
When a contractor hangs a stripping scaffold from beam bottoms 100 ft high he doesn't want to take it down until the job is completed. And that means it has to pass between pier shafts without difficulty and also reach the entire underside of the deck.

To pass between the shafts, the platform rides in trolleys at the bottom of ten hangers. Pulled by a winch, it rolls forward as the rear pair of hangers is leapfrogged ahead. The platform passes under the pier cap and between the shafts. Because of an unfortunate stringer spacing, hangers have to be suspended from 4x6's that span between stringers. Scaffold hangers clamp on to the bottom flanges.

Forms directly above the platform are stripped first. Some pieces can be dropped to the ground, but others must first be bundled and lowered with ropes. Forms beyond the reach of the platform are stripped from an upper platform that cantilevers first in one direction and then in the other. It is assembled by feeding 2x6's through slots in the hangers and covering them with planks. When one side is stripped, planking is removed, the 2x6's are shifted to the other side, and the planks are laid out again. Before the scaffold is moved ahead, the upper platform is dismantled and the pieces laid temporarily on the lower platform. Wire mesh railings protect men from falling off.



TEAM of Northwest backhoes makes two passes to dig 35-ft trench at tunnel shaft. Clamshell does tricky excavation job at portal.



DEEP CUT carries 84-in. concrete pipe into sewage treatment plant. Good material permits open cut operation.

How to Build 17 Miles of Deep City Interceptors

WHAT can a contractor expect to run into on a job of building 17 miles of big sewers through a highly congested city? Just about every obstacle to construction you can think of. Garden State Constructors and Associates are finding that out in Jersey City, N.J., where they are pushing a $30 million project.

It's tough going. A jungle of railroad tracks requires nearly 40 separate crossings, mostly tunnels. Heavy traffic hampers open-cut operations. Ground varies from hard rock to just plain garbage. And high tides back up in existing sewers, sometimes threatening to break through exposed walls.

Yet the job is running ahead of the 2-yr schedule called for by the Jersey City Sewerage Authority.

It's a big job. Besides 78,000 ft of reinforced concrete interceptor sewer ranging in size from 24 to 96-in. dia, it also includes two treatment plants, a pumping station, 36 interceptor chambers, and a 29,000-ft long sludge force main of 6-in. cast iron pipe.

Because the city is bounded on two sides by water, the interceptor system is divided into east and west sections. Pipe lines along the east side intercept all outfalls of the existing system which now



CABLE pulls 84-in. pipe section into position. Bracing prevents use of hook. Note how trench is rebraced with soldiers and high cross pieces to permit pipe movement.



TIMBER FRAME supports steel sheets as hammer drives piling for deep trench in bad material. Material inside is then excavated. Few braces permit easy pipe laying.

dump combined raw sewage and storm water into the Hudson River. West side lines pick up all outfalls dumping into Newark Bay and the Hackensack River. The two sides are connected only by the force main running between the two treatment plants.

To distribute the work efficiently, two of the five joint-venture firms are assigned to the east side, two to the west, and one to the plants and pumping station.

A feature of the job is the diversity of construction methods. No area or operation can be called typical. Both open-cuts and heavily-sheeted trenches are common. In some materials, trench walls can be cut almost vertical; in others, slopes must be stepped to prevent sliding. Accurate knowledge of ground conditions is vital to the contractor because trenches average 20 ft deep, and some are more than 40 ft deep. There are all kinds of ground—rock, running sand, marsh, good and bad clay, cinders, boulder fill—and even toothpaste. One sewer near a Colgate plant plunges right through a waste toothpaste disposal area. Others run through garbage dumps.

Workhorse of the job is the backhoe. Garden State operates a fleet of more than 15 rigs, mostly Northwest Model 95's with 2½-yd buckets. Each big unit generally handles trench excavation by itself. But sometimes on deep cuts dozers first strip the overburden, or two backhoes work in tandem. In muck or marsh material, backhoes often cast behind them to a dragline.

Regardless of material, in open cuts backhoes excavate only enough trench for a few lengths of pipe. If the bottom of the trench is kept dewatered by wellpoints or sump pumps, pipe-laying crews usually can keep pace with the rig. Seepage often is allowed to run back through the pipe to a sump, where it is removed with a Moretrench 10-in. pump.

Sheeted Trenches

In restricted areas, or in very unstable material, the contractor resorts to sheeted trenches. Wood sheeting was used extensively at first, but now steel sheeting is proving faster and easy to place. It also provides better working area for pipe-laying crews. Besides, when wood sheeting is installed in deep trenches it requires an intricate network of cross braces. To provide room for the huge pipe sections, the lower braces have to be removed carefully as the load is transferred to heavy soldiers and top braces.

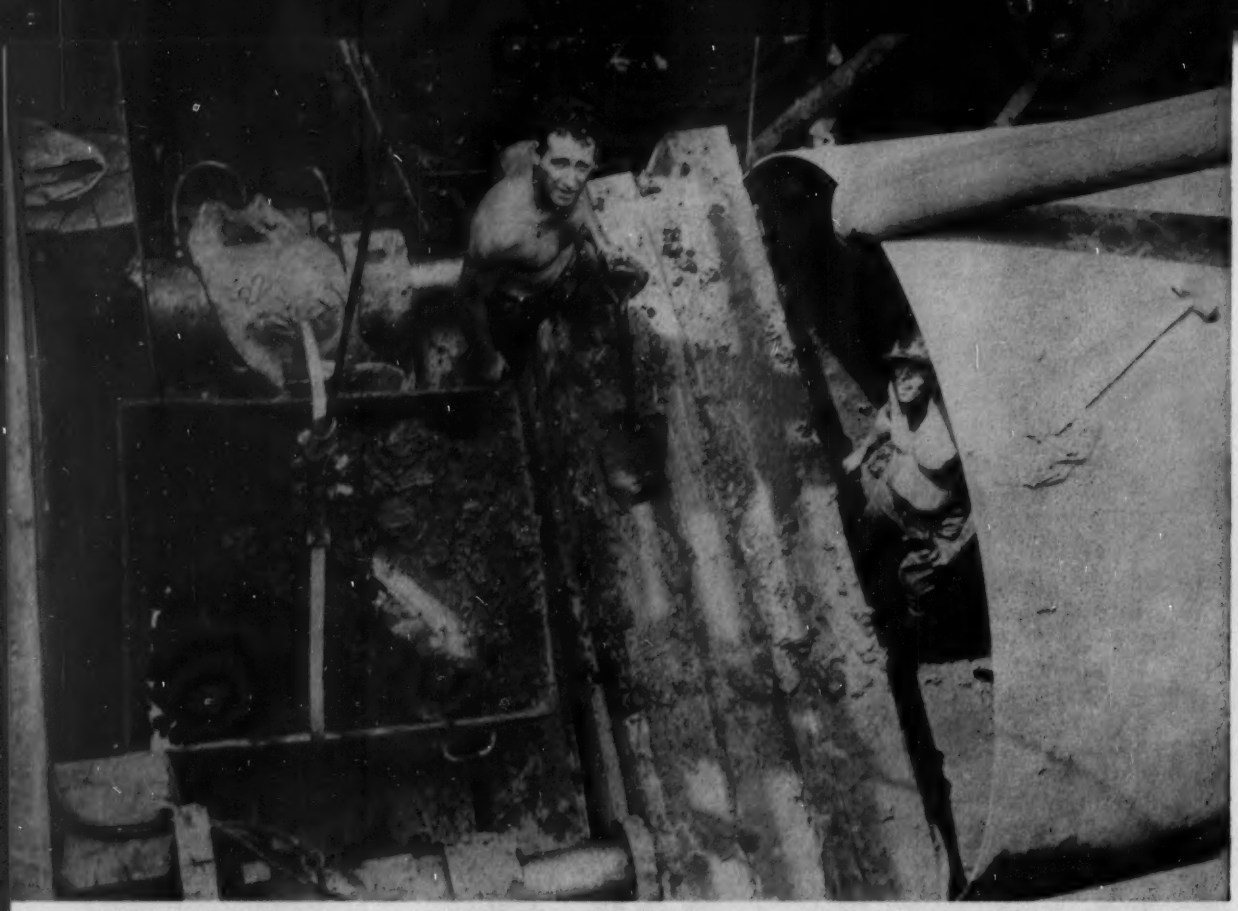
This process is unnecessary with steel sheeting. The operation is simple. Sheets are stood up against two opposite sides of a wood guide frame placed over the centerline of sewer line. For deep cuts, the top of the ground is stripped, and the frame placed inside for maximum sheeting penetration.

Behind this operation a backhoe excavates the trench between the sheets. Often only one level of cross bracing is required, and this is usually out of the way of the pipe. Piles then are driven inside where required. They are capped with concrete, and pipe-laying crews follow behind. If excavated material is suitable, it is spread over the pipe as backfill. If not, crushed stone is brought in.

Building interceptor chambers also presents problems because the existing outfalls must be kept in operation at all times. If there is room, workmen first build a by-pass around the chamber location. Then at low tide, they block the outfall, break through the wall, and allow the sewerage to run through the by-pass. In this way, the chamber can be constructed without any interference.

In restricted areas, however, the by-pass method cannot be used. Instead, the contractor replaces the brick outfall section in the chamber area with a steel pipe. It is tricky to build the chamber around

(Continued on next page)



MUCK BUCKET is hoisted up as two 250-ton Dudgeon jacks with 24-in. strokes push 102-in. dia steel shell 35 ft. After shell holes through concrete base will be poured inside at exact grade and lengths of 72-in. pipe will be pulled in and assembled.

Steel Shell Jacked—Then Pipe is Assembled Inside

DEEP SEWERS
Continued . . .

the pipe, but there is no other way to do it.

More than 30 tunnels are required. Most of them are liner-plate types, but a few short ones are done with timber. Railroads account for most of the tunnels, but a few highly congested areas also are tunneled. The longest is 1,830 ft and is poured with forms.

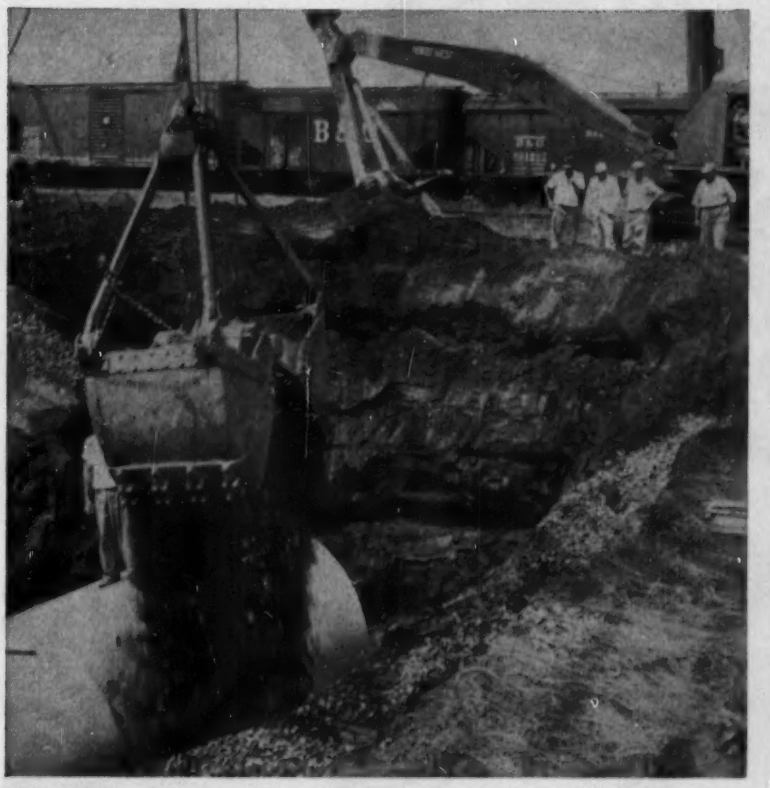


PIPE SECTIONS 42 in. in dia are pulled into 60-in. dia steel shell and joined. Concrete base in shell positions pipe. Steel shell was jacked 128 ft through clay.

At three locations, clay material made pipe jacking preferable to tunneling. But the contractor had to toss out the conventional method. The grade was too flat. Instead of placing a cutting edge on the lead section and jacking the pipe itself, a steel shell first was jacked the full distance and mucked along the way. A concrete base then was poured in the shell at the exact grade. Then, pipe sections were pulled inside the shell and joined. The space between pipe and shell was grouted.

Tides Threaten

Tide has to be watched closely. There are no tide gates on the old outfalls, and, if too much old outfall is exposed during construction of chambers or similar structures, a high tide backing up through the outfall can easily break through the brick walls and flood the area. The only way to avert the danger is to expose only small areas at a time, and keep them covered with sand bags during high tides. All interceptors in the new system will have tide gates.



CLAMSHELL backfills around pipe as backhoe cuts trench across 900-ft wide railroad freight yard. Lines of standing trains are broken as the operation moves ahead. Trucks carrying pipe and backfill ride on temporary plank road laid alongside trench.



SECTION of Massey flat base pipe is held in position as workmen prepare foundation. Note two smaller pipes also laid in trench.

Pipe Line Crosses 880-Ft Railroad Yard in Only 5 Days

Most spectacular open cut operation on the big sewer job was laying an 880-ft line of pipe across an active freight yard. Working round-the-clock for only 136 hr, the contractor placed 80-x80-in. Massey flat base pipe in an 18-ft trench, backfilled, and replaced all track.

It was a well-planned operation. Weeks before the job began, the contractor met with railroad officials to work out details. The job had to be done fast, and with minimum interruption of rail traffic. To do this, the railroad company offered to break standing trains along a 170-ft wide path as the operation moved across the yard. Through trains on the most active tracks would be rerouted.

But there were other problems, too. Most of the excavated material would be unsuitable for backfill, and tons of stone would have to be hauled in. Transporting pipe sections would also be tough. To solve the handling problem, the contractor built a combination stone and plank road alongside and 50 ft from the trench.

Still more planning was required before the trenching could begin. Knowing that a trench was about to be cut across the huge freight yard, the City of Jersey City made a separate contract with the contractor to lay two other pipes at the same time. They were anxious to encourage development of a large area beyond the tracks, and needed only water and sewer lines to do it. They called on the contractor to lay a 24-in. sewer main and a 12-in. water main in the same trench with the big flat base pipe.

When all preparations were completed, the contractor started the job on a Friday night to take advantage of the weekend lull. First rig in line was a Northwest 2½-yd backhoe that dug the 18-ft deep trench. It was bad ground. There was a layer of cinders on top, marsh in the middle, and clay on the bottom. The rig had to open the trench 40 ft wide on top and step the slopes to prevent slides. Besides, the water bearing marsh layer was a problem until salt hay was placed along the steps on each side. This carried excessive seepage back to a sump, where it was removed by a Moretrench 10-in. pump.

Because of the bad material, pipe sections were laid in the trench, jointed, and backfilled as soon as space was available. Cradle stone was placed by clamshell, the pipe section was laid, and immediately backfilled around its sides. Sections of 24-in. pipe were then laid, more backfill was added, sections of 12-in. water line were added, and then the trench was filled up completely. A railroad crew followed closely behind replacing tracks.

Personnel

William Bleauvelt is executive manager, Philip Salvatore is assistant executive manager, and Sam Luciano is project manager for Garden State Constructors and Associates. The joint-venture firm consists of Joseph Miele Construction Co. Inc., C. Salvatore and Sons, George M. Brewster & Son, Terminal Construction Corp., and La-Fera Construction Co., Inc.



PAVING THE CURVES at the Ford test track is a delicate operation. Standard equipment is modified to lay asphalt on a concave course at a 62% slope and skyhooked in place from tractors on the embankment. Crane-hung box feeds bituminous mix to the finisher.

Skill, Ingenuity Build Test Track

"ASPIRIN OVAL" is what construction men call the Ford Motor Co.'s new 5-mi test track in northern Arizona. The name is apt; building the track for 140-mph performance was a job with plenty of built-in headaches.

Design called for a ⅛-in. surface tolerance longitudinally or transversely on a 10-ft straightedge. Machinery had to be modified to lay asphalt on a concave course at a 62% slope and skyhooked in place while working.

Fisher Contracting Co., Phoenix, Ariz., built the $1.5 million test facility from plans drawn by Johannessen and Girand, Phoenix consulting engineers. Equipment manufacturers assisted in redesigning standard machines for this specialized job.

The test track has two highly superelevated curves, four transitional sections, and two straightaways. Width of the approximately level straightaways is 36 ft; width at the curves runs to as much as 37 ft, 2 in.

Subgrade

Excavation amounted to 380,000 cu yd. Specifications required that the surface of the subgrade vary not more than ½ in. from design elevation. The area on which the embankment was placed was scarified to a depth of 9 in., moistened to optimum moisture condition, and mixed with a Seaman Pulvi-mixer. A 50-ton Super compactor, pulled by an Allis-Chalmers HD-20, and a 50-ton Southwest, pulled by a Euclid rubber-tired tractor, rolled until compaction reached 95% of maximum density at optimum moisture content.

Embankments were formed in horizontal layers 8 in. deep by five Euclid scrapers. After watering and rolling, embankments were cut to design elevation and cross section by a Caterpillar Model 12 blade equipped with curved bits

cut from abrasion-resistant steel to fit the curve at 35-deg angle.

The blade lacked sufficient power and traction to cut the subgrade when it was held only by a Cat D-6 on the cable unit with a two-part line. It was necessary to add a Cat D-8 on about 50 ft of cable to pull the blade.

Aggregate Course

The aggregate base course consisted of approximately 106,000 sq yd to a depth of 6 in. A Cedar Rapids crusher about 3 mi. from the job site prepared all the aggregate. Belly-dump Euclid tractors hauled the material. On the straightaways, the aggregate was watered and rolled in conventional manner. On the curved sections, it was windrowed at the bottom, watered, and mixed. A Cat D-6 dozer, operating transversely to the track, placed the aggregate on the superelavated curves.

Following the dozer, a Cat D-8 compacted the material by walking it up and down the slope. The base course was rolled with a 50-ton Super compactor pulled by a Euclid rubber-tired tractor. Rolling continued until 6-in. layers were compacted to at least 95% density at optimum moisture.

The aggregate base course was fine graded to a surface tolerance of ⅜ in. from designed elevation . A Cat D-8 and two Allis-Chalmers HD-20's with conventional block and tackle rigging attached to the power units held the tractor-drawn roller on the superelevated curves.

A steel-wheeled Galion 10-ton tandem roller, pulled by a Euclid rubber-tired tractor, fine graded and rolled the aggregate base course. Then, the base was primed with 0.5 gal per sq yd of MC-1. A conventional distributor truck primed the first 24 ft, and a special spray bar, designed by System Distributing Lines, subcontractor for the oil, primed the top 12 ft.

Asphaltic Concrete

Surface and leveling courses added up to a total of 106,000 sq yd of asphaltic pavement. The leveling course contained this mix:

Aggregate	
¾ to ½ in.	26%
½ to ⅜ in.	34%
⅜ or less	31.5%
Filler	3.0%
Bitumen (penetration grade 85-100)	5.5%

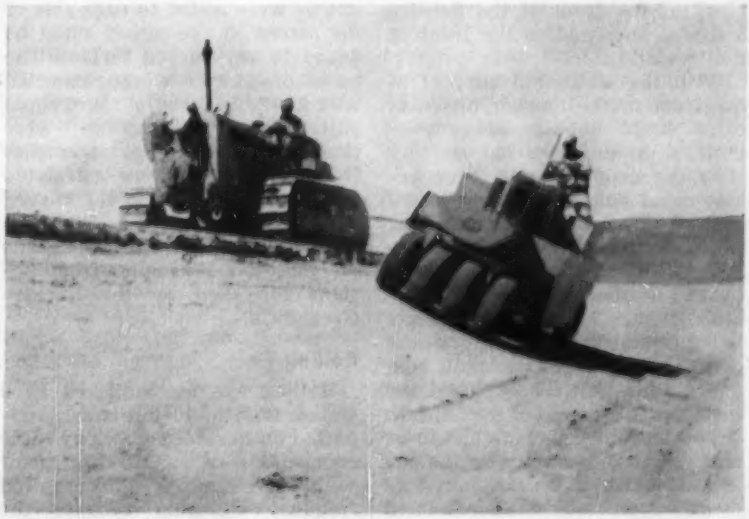
An Allis Chalmers HD-20 tractor with conventional block and



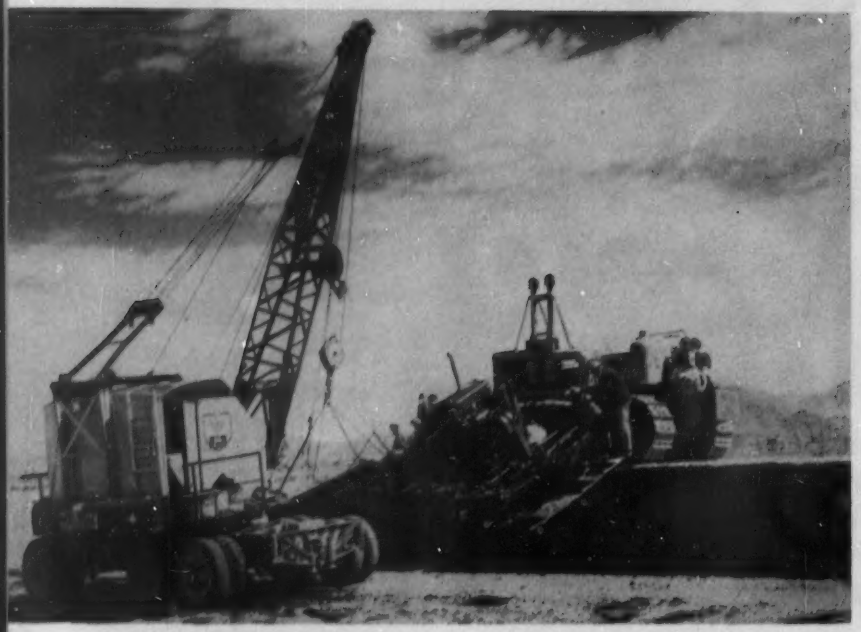
PREPARING THE SUBGRADE demands skillful equipment operation. Specifications require that the compacted subgrade vary at no point by more than ½ in. from design elevation.



FORMING THE EMBANKMENT calls for care to insure 95% compaction at optimum mositure content. Contractor built up the embankments in horizontal layers 8 in. deep.



ROLLING A CURVE is a Tampo pneumatic-tired roller. After rolling, a Caterpillar Model 12 grader with curved blade cuts embankments to design elevation and cross section.



SUPPORTING AND FEEDING the Barber-Greene finisher on the curve sections takes close coordination. Allis-Chalmers HD-20 holds finisher, and Link-Belt crane feeds it.

tackle rigging supported a Barber-Greene 879A finisher on the superelevated curves. The holding mechanism between the finisher and the tractor was kept flexible to give the finisher steering control and to allow for varying amounts of material in front of the finisher.

A cable off the tractor power unit ran over an A-frame to a weight box, then back over the A-frame, through the center of gravity of the tractor, and to the finisher. It was routed laterally to a block and tackle system of six parts and anchor. It passed through a single block at the front of the finisher and was anchored to the front of the tractor.

With the additional support at the front of the finisher, the machine could be steered conventionally around the curves. By changing weights, the tractor operator could hold the finisher in the desired position, and, by playing the cable in and out, he could determine the position between tractor and finisher.

To deliver bituminous concrete to the finisher, supply trucks dumped into a specially built box, and a Link-Belt crane placed the material at the front of the finisher.

The finishing machine had to be modified to compensate for the angle at which it was required to operate on the superelevated curves. A divided plate was placed in the center of the hopper to direct all the material to the high side of the screw conveyors, which had to be crowded to get sufficient material to the extreme high side of the screed.

Major modifications were required in the screed to make it fit the cross sections of the curves. These were difficult because the screed had to be adjustable to conform to sections that changed every 25 ft in the transition sections.

The entire screed assembly was raised 5 in. to allow for a maximum negative crown adjustment of that amount. Three pairs of adjusting screws were added to each side of the screed so the screed could be flexed to any curved surface. The pairs of screws were connected with a bicycle chain to insure equal adjustment. The screws were changed with rachet wrenches from charts that were calculated for 1/32-in. change in the curved surface.

Fisher's maintenance shops made all these modifications from designs furnished by the Barber-Greene Co.

Rolling

Rolling was accomplished by a Galion tandem 10-ton roller, supported on the steep slopes by cable connections to an HD-20 tractor with an A-frame. Weights required frequent changing because the rolling was done from the bottom to the top of the bituminous mix.

Fisher took precautions to secure uniform compaction by balancing the forces on the roller. The three forces acting on the roller were: the force of weight through the center of gravity on the roller, the road reaction normal to the surface of the pavement, and the force on the cable attached to the holding mechanism.

Both the road reaction and the weight reaction passed through the center of gravity of the roller. That made it possible to build an adjustable hookup so the cable reaction, also, would pass through the center of gravity. Then, the cable force could be calculated for equilibrium easily. Operators used tables worked out in advance to determine the height of the cable hitch on the roller and the required weights for cable loads.

Special rollers with radii of curvature of 40 ft were used to approximate the curve cross section on the high side of the full curve sections. One of these special rollers, in combination with a flat-wheel Galion tandem and a small sidewalk roller, made it possible to get compaction and smoothness on surfaces of less radii of curvature.

Skilled Operators

The tractor operator on the finisher was responsible for maintaining the correct amount of weight and stay. The finisher operator controlled the machine for direction and for even distribution of material to the road surface. There were two operators on the right rear. One controlled mat thickness; the other made the joints and assisted in screed adjustments.

The roller operator sealed the joints and rolled up the slope in the conventional manner. Operators of the holding tractors stayed even with the roller and maintained the correct amount of cable to position the roller on the curve.

The rolling operation could stop and change directions at any time so long as both operators coordinated their movements. An additional operator changed the weights when new positioning of the roller was necessary.

The 1½-in. mat for the leveling course varied no more than ¼ in. from designed elevations. A tack coat of RS-1 in the amount of 0.10 gal sq yd was placed on the leveling course. The 1-in. compacted surface course went down immediately after. Mix was similar, but tolerances were tightened.



Where street is too narrow for operation of dump trucks alongside trench . . .

Conveyor Backfills Sewer

A ROUND-ROBIN SCHEME for handling trench excavation and backfill worked out "just fine" for the Walter L. Follmer Co. on a sewer project in Ohio. A backhoe opened up the ditch, dumping excavated material on to a belt conveyor that carried it around the pipelaying operations and then passed it back into the trench as fill.

The Hamilton, Ohio, contractor worked up the technique in order to lay 2,860 ft of 54-in. dia Armco corrugated sewer pipe in Middletown's 15th Avenue. The pipe had to go down the center of the relatively narrow street, and trees alongside could not be moved or damaged. All this precluded the use of dump trucks for handling spoil.

So Follmer had E. F. Marsh Engineering Co. build a special gasolene-powered 24-in. belt conveyor 60 ft long to work parallel to the trench. A P&H 655B backhoe fed a hopper over the lower end of the conveyor, and a swivel chute at the other end directed material where required. Because the chute could not reach over to backfill the far side of the pipe, a Caterpillar D4 Traxcavator handled this chore. It picked up material dumped in the street by the conveyor and moved it into place. The tractor-shovel also loaded excess spoil into trucks for disposal.

As the job progressed down the street, the backhoe would move the hopper and conveyor ahead with it. The machine also advanced a steel box frame, or shield, that protected men laying pipe in the trench from caving gravel banks. Within the shield (20 ft long, 12 ft high, and 8 ft wide), workmen coupled on 16- and 18-ft lengths of the 54-in. Armco pipe whose invert was approximately 16 ft below street surface. They also joined up the house connections, which had been placed before the pipe went into the trench.

CM&E asked Follmer about job progress with the conveyor handling the backfill. While a company spokesman admitted it was not quite as good as they had experienced on other jobs where they were able to use trucks, the job went "just fine." And trucks were taboo on this one.

Foreman for the Walter L. Follmer Co. was Charles Stayton.

The Trend . . .

MERGER TREND is clearly evident in this listing of the wholly-owned subsidiaries of 10 major construction equipment manufacturers. Only those subsidiaries and divisions that manufacture construction equipment are included. Years in parentheses indicate dates of acquisition.

Allis-Chalmers Mfg. Co.
- Ryan Mfg. Co. (1932)
- LaPlant-Choate Mfg. Co. (1952)
- Buda Engine Co. (1953)
- Baker Mfg. Co. (1955)

Baldwin-Lima-Hamilton Corp.
- Lima-Hamilton Corp. (1950)
- Austin-Western Co. (1951)
- Madsen Iron Works (1954)

Caterpillar Tractor Co.
- Russell Grader Co. (1928)
- Trackson Co. (1951)

Clark Equipment Co.
- Ross Carrier Co. (1953)
- Michigan Power Shovel Co. (Ross subsidiary, 1953)

General Motors Corp.
- Allison Corp. (1928)
- Cleveland Diesel Corp. (now Detroit Diesel Div.)
- Euclid Road Machinery Co. (1953)
- Yellow Truck & Coach Co. (Now GMC Truck & Coach Div.) (1943)

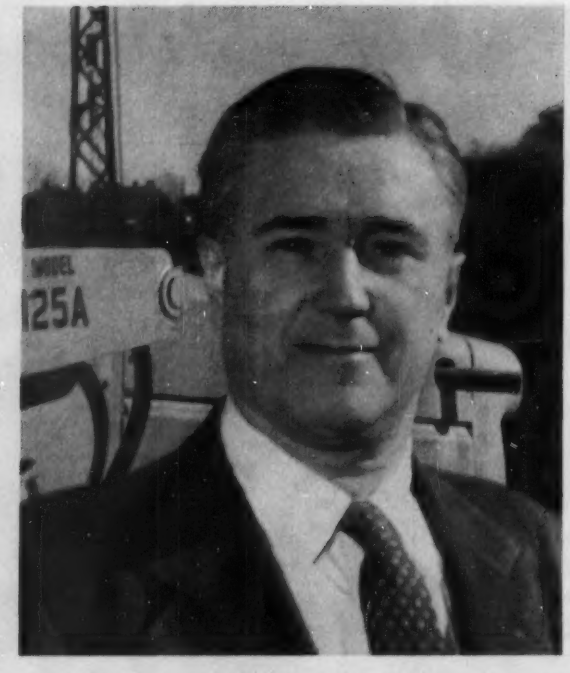
International-Harvester Co.
- Frank G. Hough Co. (1952)

Oliver Corp.
- Cleveland Tractor Co. (1944)
- A. B. Farquhar Co. (1952)
- Be Ge Mfg. Co. (1953)

Pettibone Mulliken Corp.
- George Haiss Mfg. Co. (1946)
- Universal Engineering Corp. (1948)
- Rome Grader Div. of Union Fork and Hoe Co. (1951)
- Wood Mfg. Co. (1953)

Thew Shovel Co.
- Universal Crane Co. (1923)
- Dixie Crane & Shovel Co. (1954)
- Byers Machine Co. (1955)

Westinghouse Air Brake Co.
- LeRoi Corp. (1952)
- R. G. LeTourneau, Inc. (1953)
- George A. Failing Co. (1953)
- J. D. Adams Co. (1955)



RAY J. FINN, 1955 AED president
"The situation is uneasy . . ."

What Mergers

By FRANK CORRIGAN
Assistant Editor

THE RUSH OF MERGERS in the construction equipment manufacturing industry raises problems that will influence contractor operations for years to come.

Familiar trade names like LaPlante-Choate and Rome have disappeared from distributors' showrooms in the past five years. Other equipment manufacturers have managed to retain their trade names—but not their independence. These include Euclid, Wooldridge, Marion, Osgood, LeTourneau, Hough, LeRoi, and a host of others.

Who benefits from these mergers? How did they come about? What do they mean to the contractor? To answer these questions CM&E has made a study of the background and importance to the contractor of mergers in the field of equipment manufacturers. From the contractor's point of view, here are the two sides of the coin—both advantages and disadvantages:

ADVANTAGES

• **Prices**—A drop in equipment prices is not yet apparent but these mergers should result in manufacturing and distribution economies, and so lower prices. The Bureau of Labor Statistics reports that equipment prices last November were 8% higher than in November of 1954. But it notes a leveling off near the end of 1955. When newly consolidated companies have written off the cost of preliminary



JOHN GWYNNE, FTC Commissioner
"Present laws are inadequate..."



R. Q. ARMINGTON, GM-Euclid Gen. Mgr.
"We needed $30,000,000..."

Mean to the Equipment Buyer

development and plant expansion, there is a good chance that they will be able to hold prices steady, despite rising labor and materials costs.

• **Parts availability**—Large manufacturers can more readily establish and supply centrally located parts depots. Twenty-four hour service in emergencies is already standard practice in the industry.

• **Training**—Manufacturers already have increased the training facilities available to contractors' employees. Besides elaborate factory training centers, they have "trailer courses" touring the country and centrally located permanent training schools.

• **Research**—Manufacturers with greater financial resources can afford more research and testing. They do not have to rush a new piece of equipment on the market until exhaustive research has proved its worth.

• **Servicing**—The larger manufacturer can encourage improved service facilities, provide up-to-date technical data, and train distributors' maintenance men.

• **Engineering**—Merged companies usually pool their design and engineering forces and increase engineering budgets. This should result in better equipment.

DISADVANTAGES

• **Overstandardization**—Small manufacturers, even when making heavy equipment, can place more emphasis on the special rig designed to serve a limited market, or to meet conditions in a specific section of the country. Larger manufacturers tend to standardize their products.

• **Fewer manufacturers**—The Federal Trade Commission says, "Mergers may lead to socially desirable developments to the extent that they increase efficiency in production and distribution. But they may also lead to undesirable results in that they may restrain or eliminate competition or tend toward monopoly in particular lines of goods or services." As one industry executive told CM&E: "Competition is a great leveler."

• **Distributor realignment**—Manufacturer mergers sometimes mean that a distributor must switch its product lines in order to maintain a matched line of equipment. The contractor who favors a particular line of equipment may have to switch distributors. This may mean the end of a close contact, built up over the years, that has proved mutually beneficial.

DISTRIBUTORS SAY—

Mergers have had relatively little effect on the contractor yet, but the distributor has felt the full implications almost from the time the trend started.

"The situation has played havoc with some of us," one distributor said. "Conflicting and competitive lines of equipment have forced us to make some rough decisions."

(Continued on next page)

MERGERS

Continued from page 63

He was referring to the distributor who for many years may have handled a scraper made by the ABC company. Now, the XYZ Corp., which has specialized in tractors, buys out another scraper manufacturer and confronts the distributor with its line of scrapers.

Even though his original line of scrapers is selling well and meeting with his customers' approval, the distributor may have to make the change to match his equipment. "It was like starting in business all over again," a distributor faced with this problem said.

Ray Finn, 1955 president of the Associated Equipment Distributors and a principal in Bode-Finn Co. of Cincinnati, told CM&E: "Undoubtedly there have been hardships for some distributors. The situation is still an uneasy one. I think it can largely be attributed to growing pains in a mushrooming industry. The rapid mechanization of the construction industry in the past few years has been astounding."

As far as the contractor is concerned, Finn, like most industry leaders, believes the effects of the consolidations "have not yet been noticeable." However, he said he foresees better service, research, and training facilities in the near future.

One reason why implications of the mergers have not yet been fully experienced by the contractor is that manufacturers have tended to follow the acquisitions of new companies with a period of cautious development and research.

The main reason for this cautious approach is also a big reason for the merger trend in the first place. This is simply the high unit cost of today's heavy construction equipment.

MANUFACTURER'S PROBLEM—

The contractor has demanded larger tools. The manufacturer will meet his demand, but not until he is convinced that the bigger machines will do the job the contractor wants done in the way the contractor wants it done. This is true because not even the largest manufacturer can afford to gamble on a new product with a five-figure selling price. Before he goes into production, the manufacturer must be sure of his market and then must produce a product that the contractor will accept.

There has never been a period when manufacturers have spent as much time and money on research as in the past few years. They are doing this not only because they *want* to produce a better machine, but because they *have* to produce a better machine. They simply cannot make too many mistakes in design when the selling price for a single unit is in the five-figure bracket.

Even industrial giants like General Motors Corp. must live by this fact of business life. After its purchase of the Euclid Road Machinery Co. in 1953 it was obvious that GM, through Euclid, was about to enter the crawler tractor field, and in a big way.

However, it was more than a year before GM-Euclid, after exhaustive tests, went into production with its revolutionary twin-engined TC-12. Even after it was in the field, Euclid engineers followed their brain-child across the country, watching it work under all conditions. Almost another year passed before Euclid produced its second crawler. In design and power, the C-6 so closely resembled exactly half of the TC-12 that it has been referred to as the TC-12's "half-brother." Euclid, it appears, has decided to stick by its proven prototype.

Now Euclid seems satisfied that its crawlers are accepted by contractors. Recently it was reported that Euclid will undertake an expansion program that will place it up with the industry leaders. General Motors has taken an option on a large tract of land near Cleveland where it reportedly will build a new Euclid manufacturing plant, office building, research center, and warehouse. Cost of the expansion has been estimated unofficially at $100,000,000. General Motors, incidentally, paid about $18,000,000 for Euclid's capital stock.

Euclid is not the only big manufacturer contemplating expansion. Allis-Chalmers president R. S. Stevenson last year announced a $10,000,000 expansion program, largely for the construction division. The Clark Equipment Co., whose construction equipment sales last year rose to $32,000,000 as compared with $9,000,000 in 1954, has announced that it will expand its huge Benton Harbor, Mich., plant by 50%. Caterpillar, meanwhile, is going ahead with its own building program.

SMALL MANUFACTURERS

The high unit cost of heavy construction equipment has put the relatively small manufacturer in a tight spot. No manufacturer, no matter what its product, can afford to stand still. To compete satisfactorily in an expanding market, old products must be improved constantly and new products added to the existing line. This presents a problem for the small manufacturer whose main business is the manufacture of large and expansive construction equipment. The small company cannot afford to gamble on products because of the high cost of development and production. If a small corporation makes a mistake, it's out of business.

"When many acquisitions are examined," a recent Federal Trade Commission reports says, "it is often found that the lesser ability of smaller companies to command resources needed for expansion . . . causes the smaller company to take the initiative in offering to sell." The report adds, "Then too, there are instances in which companies in financial difficulty offer to sell in order to salvage something from an impending wreck."

Appearing before a Senate Antitrust and Monopoly subcommittee studying the corporate structure of General Motors, Raymond Q. Armington, former Euclid president and now general manager of GM's Euclid division, told the investigators:

"The best we could have done (without merging) was to survive in a constantly decreasing way with the few products we had pioneered and in which we had established our reputation."

However, with Allis-Chalmers, Caterpillar, and International-Harvester going into production with rubber-tired tractors and scrapers, Euclid was forced to expand into the crawler field if it was "to grow and succeed." This, he said, would have required an outlay of about $30,000,000, and "it was just not in the cards to think that we could get that kind of money on our own."

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WHEN AN OPERATOR TURNS CONTRACTOR HE CHOOSES CAT* EQUIPMENT



That's the way it happened with J. M. Dowd, Jr., of Johnston, S. C. He's been in road building since he was 15 years old. Starting as an operator, he became a grade foreman, then a superintendent. Six years ago he bought a Caterpillar D6 Tractor with a Bulldozer and Scraper. Now he has added another D6 Tractor-Scraper unit and a No. 12 Motor Grader and is doing well with his custom contracting. In his own words, "I've always been a Cat owner. Never use anything else."

You can see the kind of work he does in the photo above. This job, near Blacksburg, S. C., called for moving 32,000 cubic yards of earth on a 1.3-mile road project. Cuts run up to 25 feet deep, and the roadway is 32 feet from ditch to ditch. He completed it in exactly two months.

For a good, clean job of bank-sloping or any other kind of grading, the Cat No. 12 is a hard machine to beat. And the new No. 12 Motor Grader is better than ever. Among other improvements it has the exclusive Caterpillar oil clutch, which reduces wear, can give you 1500 hours without adjustment.

And now tubeless tires are standard equipment at no extra cost. They eliminate an estimated 80% of down time caused by tires. Tubeless tires are easier and quicker to mount, hold air longer, run cooler, and give better puncture and blowout protection.

Your Caterpillar Dealer can show you how to speed production and cut costs with modern, heavy-duty Cat equipment. Depend on him for reliable parts and service, too.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

99% OF ALL CATERPILLAR MOTOR GRADERS ARE STILL AT WORK

MERGERS . . .

Continued from page 64

Because Euclid could not expand its line of products, it was at a "serious competitive disadvantage," he testified. Faced with this situation, Armington said he had "exploratory discussions" with International-Harvester and Allis-Chalmers on the possibility of joining with them. Then he approached General Motors, and in about six months the deal was consummated.

Another important consideration that has added to the rush of mergers in recent years is contained in the following announcement issued recently when American Hoist and Derrick Co. and American Steel Dredge Co. merged:

"The combination of our operations . . . follows the trend, evident everywhere, of firms with similar products to combine facilities in the interest of a more efficient operation than either of the two could maintain as separate entities. Although the companies do not have products in common, the products of American Hoist and Derrick Co. and of American Steel Dredge Co. are sold to the same customers through the same type of distributor."

For the same reason, American Hoist and Derrick Co. acquired control of the Thomas Laughlin Co., manufacturers of forged wire rope accessories.

"The merger will enable American Hoist Co. to market the joint products more effectively by offering a complete line of fittings and wire-rope accessories from a single source," an American Hoist Co. spokesman said at the time of the merger.

A RICH FIELD

The case of Westinghouse Air Brake Co. illustrates still another important reason for merging. For 84 years, Westinghouse had concentrated on manufacturing equipment for the railroad industry. Because of a declining market, Westinghouse decided that it had better find a new field where it could expand and diversify its operations.

The construction industry, growing year by year and with a profitable future in sight, met its requirements. To lessen its dependence on a single industry, Westinghouse, in a period of less than eight months, paid more than $34,000,000 for three prominent construction equipment manufacturing companies.

In September of 1952 it acquired the LeRoi Co., manufacturers of air compressors and internal combustion engines; in May of 1953 it bought the George E. Failing Co., makers of portable drilling rigs; and in the same month it purchased the earthmoving and related businesses of R. G. LeTourneau, Inc. It followed these acquisitions with the purchase of the J. D. Adams Co. in January of 1955.

The multi-billion dollar construction industry, and its vast potential, makes equipment manufacturing firms attractive targets for corporations outside the industry who desire to diversify their operations. Besides GM and Westinghouse, other companies who have entered the field include the Baldwin Locomotive Co. (now Baldwin-Lima-Hamilton Corp.), the Clark Equipment Co. (with the acquisition of Ross Carrier Co., and its subsidiary, the Michigan Power Shovel Co.), and Continental Copper and Brass Industries, Inc. (with its purchase of Wooldridge).

There are other reasons for merging, not the least of which is the tax situation. Paradoxically, a company that has lost money for the past few years may be a good investment for a prospering company. Under Internal Revenue Bureau regulations, it is possible to carry forward past operating losses as credits against future taxable earnings. This means that money-losing companies can use their losses in one year as an offset against profits of up to two years past or five years in the future.

When a prosperous company acquires a tax-loss company, it is allowed to deduct this tax credit from its own taxes. The savings attainable in this manned by a company with large taxable earnings that merges with a tax loss company are such that those wishing to promote such mergers have been advertising publicly their desire to acquire financially weak companies.

THE OUTLOOK

There are two considerations that could stem the tide of mergers. These are (a) a general business recession and (b) increased government regulation.

The general rule is that mergers take place more often when times are good. An expanding economy means expanding production. It is during such times that the number of mergers increases. The last rash of mergers took place in 1928. Since no recession is foreseen in the near future, it is logical to expect a continued trend toward consolidation.

The second consideration is increased government regulation. First of all, today's favorable tax situation has spurred many mergers. If the laws are tightened, it may stop some mergers from being consummated.

More important is the present attitude of the Federal Trade Commission and the Congressional Judiciary Committees. Both units of the Federal government have expressed some dissatisfatcion recently.

"The operations of merging forces on a large scale carries with it such adverse economic effects on third parties, and on the economy as a whole, as to bring their unrestrained operation into conflict with existing public policy and law," a special report on mergers by the Federal Trade Commission states. "In policing such situations there is sound basis for interference with the freedom of either individuals or corporations to acquire or dispose of property where, on the basis of considered judgment, it can be shown that adverse effects on competition, and hence on public interest, outweigh the benefits of individual and corporate freedom of action."

Federal Trade Commission Chairman John Gwynne, testifying recently before the House Judiciary Committee on two bills, requested legislation to give the Commission far reaching additional powers over corporate mergers. Describing present legislation as "inadequate," Gwynne said, "truly effective administration of the antimerger act requires additional powers in the commission."

The government is watching the merger trend very closely. However, its expressed intention is to keep hands off the situation until it becomes a threat to the economy. Whether or not the situation is approaching the "threat" stage will be hotly debated during the present session of Congress.

Whether or not its benefits outweigh disadvantages, the contractor will feel the full implications of the merger trend.

(Advertisement)

HOW TO GET LONGER LIFE AND MORE WORK

from your construction equipment

For over thirty years Stoody Hard-Facing Alloys have been accepted as the standard of wear protection, increasing overall equipment life and maintaining operating efficiency. Hard-facing procedures developed by Stoody are thoroughly field tested and proven under actual working conditions in mines located all over the globe. For all-around dependability and maximum wear resistance, no better hard-surfacing materials are made. Use Stoody and you use the best!

See the STOODY EXHIBIT—WELDING SHOW, Buffalo, N.Y., May 9-11.



POWER SHOVEL BUCKETS are kept in top condition by applications of Stoody 21. Note use of stringer beads on all wearing surfaces.



DREDGE PARTS such as the cutter head illustrated, as well as impeller hubs and vanes can be prolonged by hard-facing wearing areas. The part above hard-faced with Stoody 21 outlasted 6 unprotected cutter heads.



CRUSHER ROLLS are easier to maintain with the new Stoody Alloy Tubular Wires applied semi-automatically. Welding is several times faster than with manual electrodes, depositing 7 to 15 pounds of metal per hour.



DIAMOND CORE DRILLING EQUIPMENT including core barrels, flutes and reamers produce more hole when protected with Acetylene Tube Borium. Footage of typical sampling drills was increased from 400-500 feet to 2000-3000 feet in one drilling operation.



CRUSHER JAWS are most efficiently rebuilt with Stoody Manganese and corrugations hard-faced with Stoody 100—both materials are available in the new Stoody Alloy Tubular Wires for semi-automatic welding.



SWING HAMMERS such as this soon lose corners and edges from severe impact and abrasion. Rebuilt with Stoody Nickel Manganese and topped off with a final pass of Stoody 21, life is increased 2 or more times.

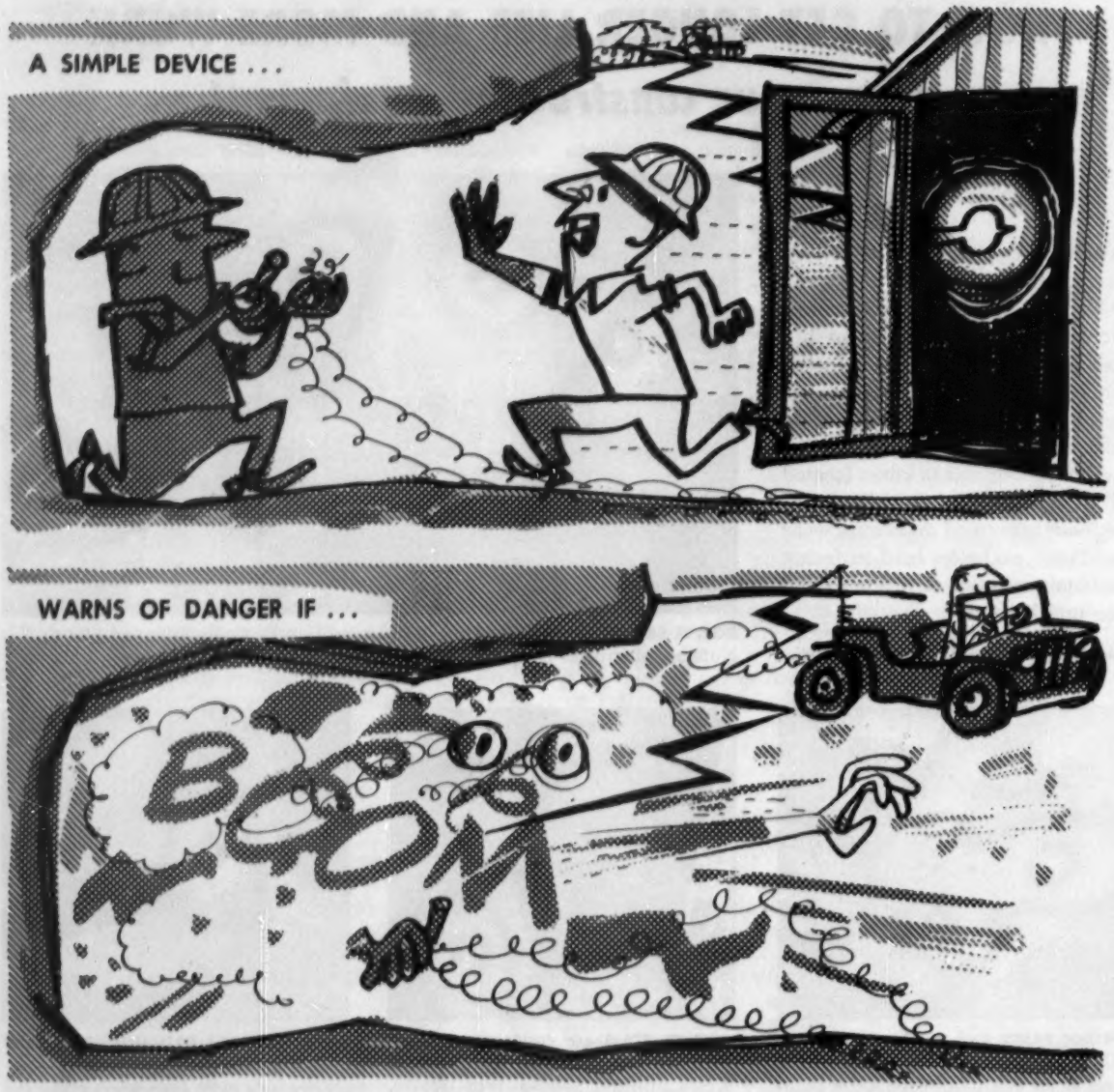


You'll find the Stoody Guidebook chock full of ideas for prolonging life of fast wearing mining equipment by hard-facing. Ask your Stoody Dealer for a copy or write direct!

STOODY COMPANY

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Whittier, California



Secret Radio Stations Create Blast Hazard

By ANDREW BORACCI
Associate Editor

OFFICIAL SECRECY created an unusual problem for the contractor on the $4.5 million Little Falls Water Supply Project in Washington, D.C. It was finding a way to prevent premature explosions of electric blasting caps from unknown amounts of radio frequency waves in the air.

James McHugh Construction Co., Chicago, has to do plenty of blasting to construct the flow-diversion dam, pump station, and water tunnel portions of the job.

But government agencies own and operate a number of radio-transmitters in the Washington area, and some of these transmitters are classified "secret". The agencies refuse to disclose information about their locations, power, frequencies, or broadcasting times.

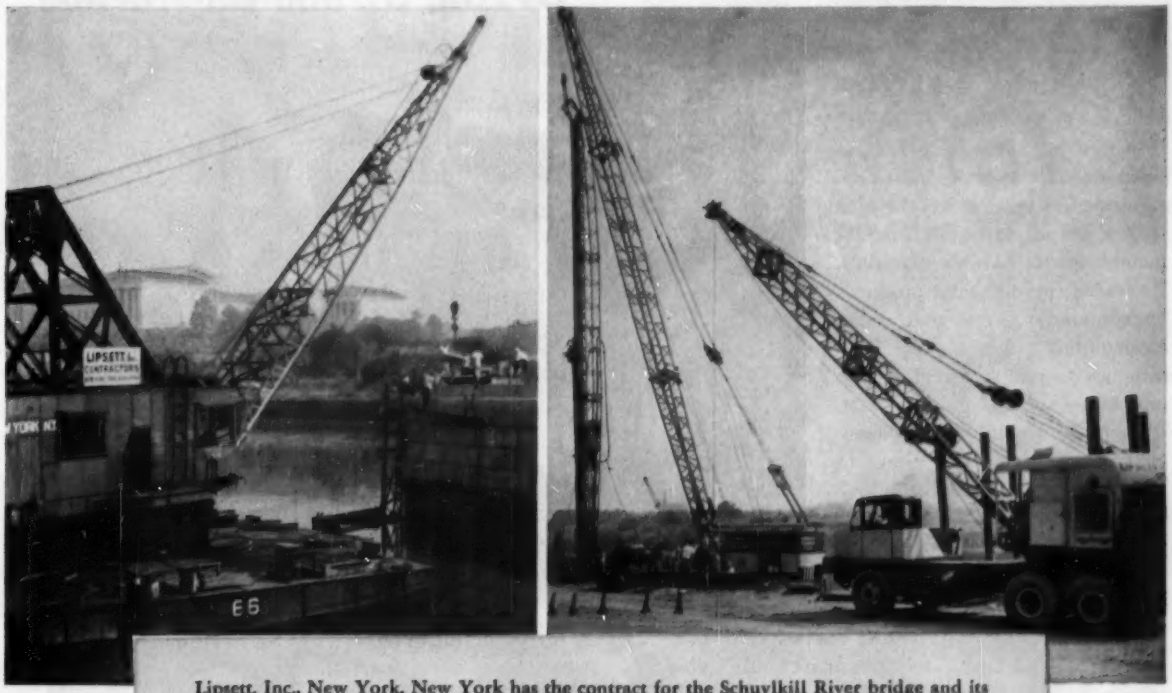
Without this information—which in most locations is readily available—such normal safeguards as blasting a measurable safe distance from known radio transmitters is out of the question.

The danger exists because wires of electric blasting caps, when uncoiled, act as antennas which pick up RF electricity from transmitters. An RF wave of 0.25 amps is all that is needed to set off the caps. Though commercial radio

GULF PRODUCTS *and* FINE SERVICE

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on Schuylkill River Expressway Project



Lipsett, Inc., New York, New York has the contract for the Schuylkill River bridge and its approaches for the Schuylkill River Expressway, which will connect with the Pennsylvania Turnpike near Philadelphia, Pennsylvania. Gulf products are keeping this contractor's modern equipment operating efficiently on the job.

IT'S a faster, smoother job when equipment delivers top performance—and the use of quality petroleum products is one of the best guarantees of that kind of performance.

That's why leading contractors, like Lipsett, Inc., select Gulf as their supplier. They have found that Gulf quality lubricants and fuels provide an extra margin of protection against mechanical delays . . . and they appreciate Gulf's prompt delivery service and helpful petroleum engineering counsel.

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NOW—Make your "CAT" a 3-Way Profit-Maker with an

ATECO ROCK RIPPER

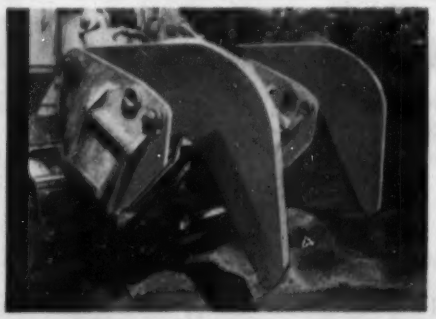
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1. Turn Former "Shoot & Shovel" Jobs Into Extra-Profitable Scraper Operations... tractor mounted design applies tractor weight *plus* ripper weight to points for fast penetration in hardest materials. Exclusive curved shank produces underground "quiver" that makes rock-splitting points act like jackhammers to split and shatter rock into easy-loading condition, fast. Result? You can scraper-load many materials you'd otherwise have to "shoot and shovel"—at handsome savings in cost!

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Why not get all the workpower you pay for out of your "Cat"? Make it a 3-way profit-maker with an ATECO ripper! See your Caterpillar distributor today to arrange a demonstration on your job, or write us now for literature and specifications.

35

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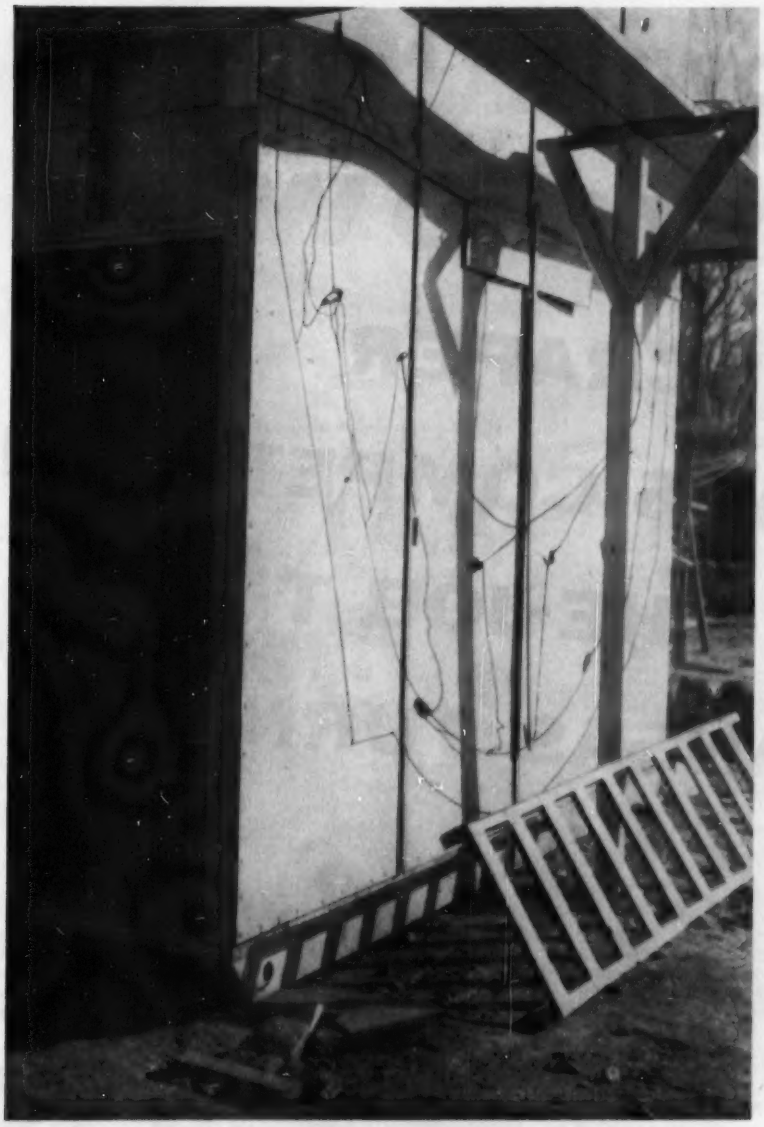
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BULLDOZERS • ROADBUILDERS • SCRAPERS • TAMPERS • RIPPERS • FARM IMPLEMENTS • FRONT LOADERS • HYDRAULIC PUMP • TANK & VALVE ASSEMBLIES



DUMMY CIRCUIT detects presence of dangerous radio frequency energy in time to call off blasting operations until source of danger is located. Wires simulate blast pattern.



LOW AMPERE bulb glows when exposed to at least 0.06 ampere of RF electricity.



BLASTING CAP WIRES when uncoiled, act as antennas, causing RF hazard.

transmitters, radar, amateur radio, microwave relay, Loran, and mobile radio units also are sources of potential hazard, their danger is minimized because of the normal measurability of their frequencies.

Dummy Testing Device

McHugh's solution was to build a dummy blast circuit, costing less than $300 to assemble, which detects any dangerous amount of RF energy in the blast area in time to suspend loading of explosives or call off a blast entirely. He uses two circuits. One simulates the horizontal tunnel blast pattern; the other, the vertical pump station excavation pattern.

RF waves were recognized as a potential hazard during the middle 1940's when an explosion on a seismograph shooting boat surveying for oil in the Gulf of Mexico led to an investigation. Cause of the blast was found to be radio induced current in an electric blasting circuit.

Though only this one accident has been proved to be the direct result of RF energy, the U.S. Army Corps of Engineers has enough respect for the potential hazard to demand that all of its contractors engaged in blasting set up means for testing against excessive RF.

Army engineers insisted McHugh test in accordance with a pamphlet published by the Institute of Makers of Explosives entitled "Radio Frequency Energy, a Potential Hazard in the Use and Transportation of Electric Blasting Caps."

The pamphlet lists two methods of testing. (1) Radio frequency ammeters; (2) Dummy electric blasting circuits.

McHugh uses the dummy circuit for economy reasons.

"With the amount of blasting we're doing," said Roy Stickney, McHugh's job superintendent, "the use of ammeters would be too costly and too time consuming."

Stickney explained that for accurate tests an ammeter would be needed for each cap used in any one blast. Since the tunnel blast pattern runs 36 to 40 holes with

(Continued on page 74)

CAT* DW21 – NO. 470

LOWBOWL SCRAPER OUTLOADS COMPETITION IN ON-THE-JOB TESTS ON KANSAS TURNPIKE

1. TESTS WERE MADE on contractors' jobs on the Kansas Turnpike. They covered a period of three weeks. For each comparison, the competing units were loaded under similar conditions. Soil density tests were performed right in the loading area to provide an accurate measure of scraper load in pay yards.



2. FIELD ENGINEERS weighed load after load as the competing units passed over a portable platform scale. By subtracting average empty weight from average gross weight, they determined average net load weight. In every test, the No. 470 Scraper with exclusive Caterpillar Lowbowl design consistently carried larger payloads.



3. JOB STUDIES showed that the new turbocharged 300 HP DW21 Tractor had the "go" to equal or beat other units in cycle time while carrying more pay yards. Other features contributing to this unit's success were large 29.5-29 tires, an efficient power train, synchro-safe brakes and the fast, responsive No. 27 Cable Control.



4. LOWBOWL DESIGN, developed by Caterpillar, is a feature of the No. 470 Scraper. With this new concept, the bowl has been widened and lengthened, yet its depth has been decreased. But Lowbowl design is more than just dimensional changes. As the tests show, material is loaded with less resistance clear out to the end of the loading cycle.



TEST RESULTS

No. 470 Lowbowl Scraper (18 cu. yd. struck capacity) vs Competition

No. 470
AVERAGE LOAD
18.1
BANK CU. YD.

Scraper A
18 cu. yd. struck capacity
AVERAGE LOAD
14.8
BANK CU. YD.

LOWBOWL ADVANTAGE:
3.3 bank cu. yd. per load

Test conditions: Damp silty clay—density: 3300 pounds/cu. yd. **Weight Comparisons:** Average net load, pounds: No. 470—59,840; Scraper A—48,675.

Comments: On one load, the operator of Scraper A was asked to obtain maximum heap. It took 2.40 minutes of push loading to pick up a load which weighed 58,875 net pounds—less than the average load carried by the No. 470!

No. 470
AVERAGE LOAD
18.1
BANK CU. YD.

Scraper B
Sideboarded—
18 cu. yd. struck capacity
AVERAGE LOAD
14.3
BANK CU. YD.

LOWBOWL ADVANTAGE:
3.8 bank cu. yd. per load

Test conditions: Sandy clay. Density: 3100 pounds/cu. yd. **Weight comparisons:** Average net load, pounds: No. 470—56,225; Scraper B—44,400.

Comments: Average loading time for both machines was comparable. In total cycle time, the DW21 had the advantage. Its transmission provided a better match to rimpull requirements, and its shorter turns saved time on the fill.

No. 470
AVERAGE LOAD
18.1
BANK CU. YD.

Scraper C
18 cu. yd. struck capacity
AVERAGE LOAD
14.3
BANK CU. YD.

LOWBOWL ADVANTAGE:
3.8 bank cu. yd. per load

Test conditions: Damp silty clay. Density: 3300 pounds/cu. yd. **Weight comparisons:** Average net load, pounds: No. 470—59,840; Scraper C—47,290.

Comments: Scraper C, like Scraper A and the No. 470, has a rated capacity of 18 cu. yd. struck. On the job, where results, not rated capacities, are the true yardstick of a machine's ability, the No. 470 Scraper with Lowbowl design decisively outloaded the other two.

No. 470
AVERAGE LOAD
15.6
BANK CU. YD.

Scraper D
Sideboarded—
18 cu. yd. struck capacity
AVERAGE LOAD
13.3
BANK CU. YD.

LOWBOWL ADVANTAGE:
2.3 bank cu. yd. per load

Test conditions: Heavy clay. Swell about 40%. Density: 3440 pounds/cu. yd. **Weight comparisons:** Average net load, pounds: No. 470—53,550; Scraper D—45,630.

Comments: In the tests, Scraper D scored next best to the No. 470. *Scraper D is the "old" DW21-No. 21,* a unit that set records for high production at low cost the world over. Now, in the new DW21-No. 470, Caterpillar has produced a unit that's even better—and way ahead of competition!

Results on the job, not rated capacities, are the only true measure of a machine's ability to produce. Check the results here and judge for yourself how much the *extra yards* moved by the DW21-No. 470 Lowbowl Scraper can mean *profit-wise* to you!

Your Caterpillar Dealer has a complete report of this on-the-job test on the Kansas Turnpike—as well as similar reports from other sections of the country. Ask him to show you the advantages of Lowbowl Scrapers on your job.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

BIGGER, FASTER LOADS WITH LOWBOWL SCRAPERS

TABLE OF SAFE DISTANCE

Transmitter Power (Watts)	Minimum Distance from Blast Area (Feet)
5-25	100
25-50	150
50-100	220
100-250	350
250-500	450
500-1,000	650
1,000-2,500	1,000
2,500-5,000	1,500
5,000-10,000	2,200
10,000-25,000	3,500
25,000-50,000	5,000
50,000-100,000	7,000

NOTE: Because RF energy decreases with the square of the distance from the transmitter, there must be a minimum distance beyond which it is safe to conduct electric blasting operations even in the worst of conditions. The Institute of Makers of Explosives recommends the following distances based on the power of the transmitter.

three shots every 24-hr period, 40 ammeters would be needed with a man on each ammeter to conduct the tests quickly. Cutting the number of ammeters used would mean too great a delay in the time taken for testing.

The problem would be still greater for the vertical blasting because 40 and 50 holes are drilled for each shot, and a test would have to be conducted for each charge.

Using the Device

"The dummy circuit," Stickney said, "is inexpensive to build and costs little to maintain. Besides, it requires only one man to check for RF energy before each load and blast."

Stickney laid out the dummy blast circuit with a test device for each cap in the blast pattern. The device is a No. 47 pilot light which glows if exposed to a 0.06 amp current.

Stickney's circuit simulates the pyramidal blast pattern used for the 10-ft dia tunnel. Blast holes are drilled 8 ft deep to pull 6 to 7½ ft of rock. So a wooden shanty measuring 8x8x10 ft was erected a safe distance away but directly in line with the tunnel's portal. Through one wall of the shanty a hole was drilled for each hole in the blast pattern.

On the inside face of the wall, directly opposite the holes, Stickney fitted a No. 47 pilot lamp for each hole. To each of these he ran two copper wires (to simulate the blasting cap lead wires) across the 8 ft width of the shanty (to simulate the length of the drill holes. At the holes in the wall, each pair of wires is connected and tied to a long lead, run out and suspended above ground the exact length of the wires connecting blasting caps to the blasting machine. The lead wire is extended as the tunnel progresses.

RF Checked Before Loading

Prior to each loading, a workman checks each lamp for glow. Should any bulb show the slightest glimmer, loading is discontinued. This is done despite the fact that the lamps glow at 0.06 amp, but 0.25 amp is needed to detonate the caps.

Stickney uses the same method for the vertical blasting except that the wires are hung vertically from another shanty and for greater lengths to simulate the deeper vertical blast holes which are drilled 10 to 12 ft to pull 8 to 10 ft of rock.

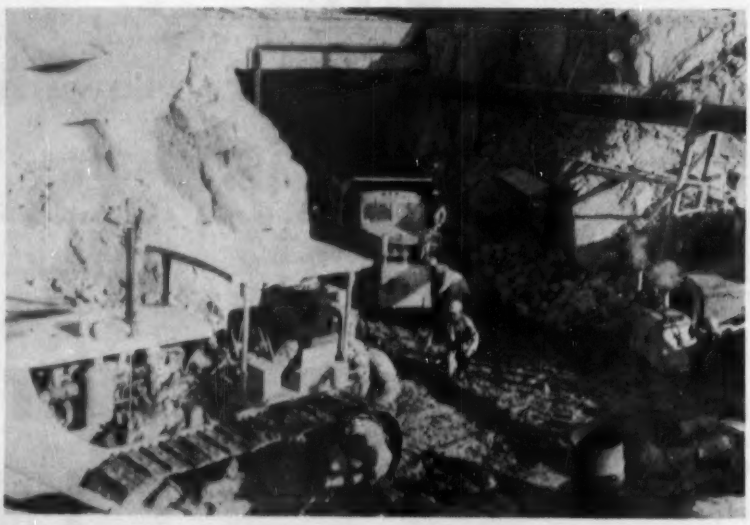
Though the contractor uses DuPont's straight delay caps, the testing device also is accurate with other caps. All commercial electric blasting caps in this country require at least 0.25 ampere.

Construction at Little Falls consists of a low diversion dam with an average height of 15 ft which spans 1,500 ft across the Potomac River, 80 ft upstream from the Chesapeake and Ohio Canal; a pumping station; two high voltage sub-stations; connected by a prestressed concrete pipe bridge; and a non-reinforced, concrete water tunnel 4,560 ft long.

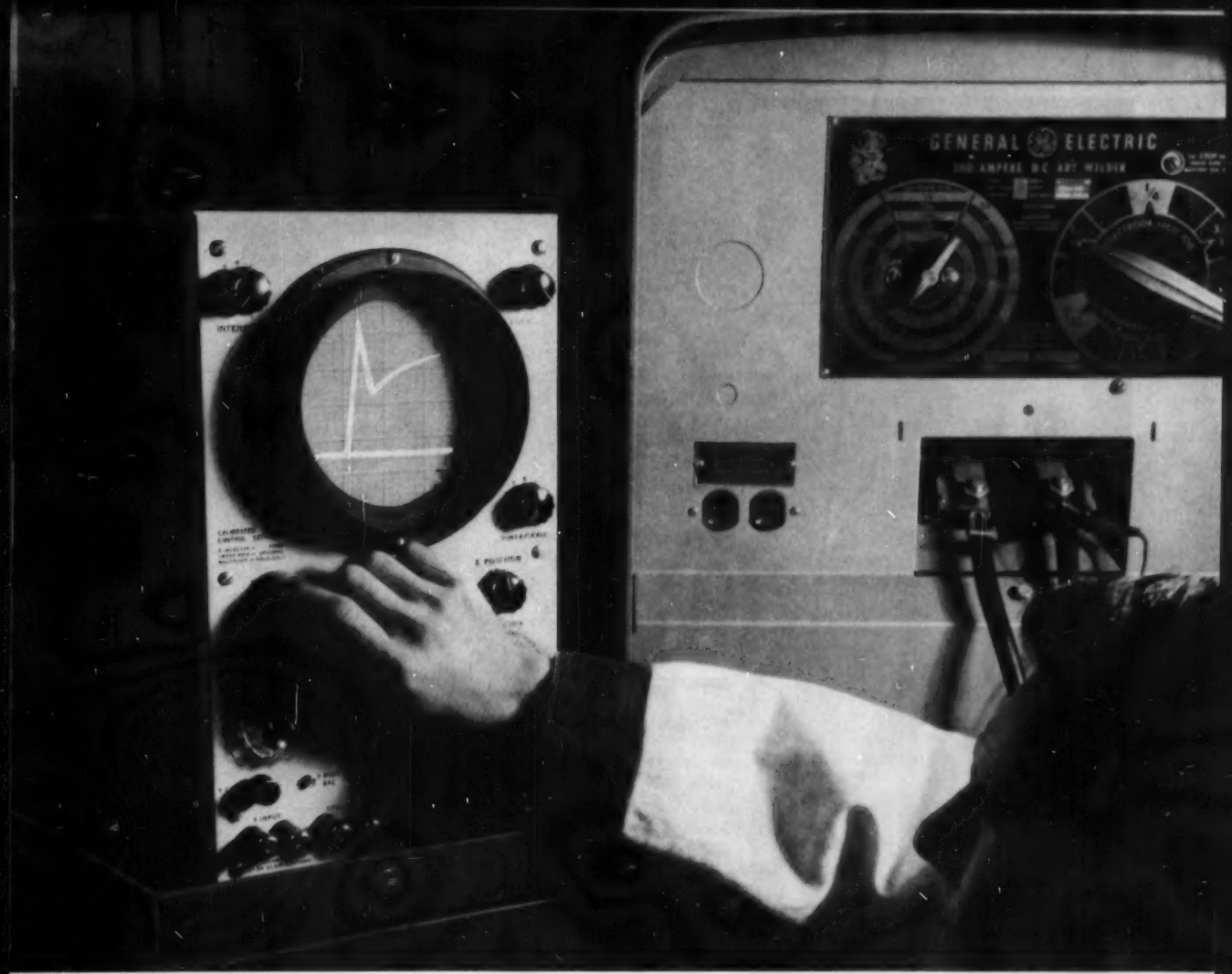
Resident engineer for the Corps of Engineers is S. E. Neely working under the Washington District headed by Col. Ray Adams, District Engineer.

Motorola Systems Engineering Dept. has developed, after extensive tests, a separate table of safe distances to guide contractors operating mobile radio transmitters on or near blasting areas.

Radiated Power of Transmitter IN WATTS	Probable Safe Operating Distance IN FEET
10	5
30	10
60	15
250	30



JOB-MADE SCRUBBERS fitted to exhausts of dump trucks purifies exhaust gases and permits the vehicles to muck tunnel after a blast with no danger to men working inside.



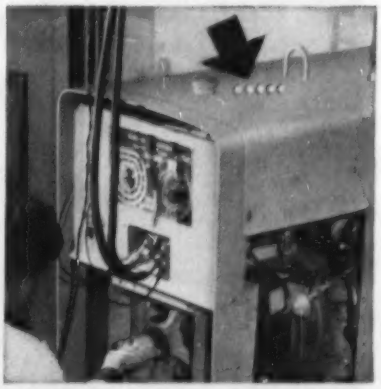
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If you're using more than a 200-amp engine-drive welder for light to medium-heavy construction, you may be losing money. You may be paying for inefficiency—compensating for excessive loss of amperage and arc heat when operating at full load for sustained periods.

Now, with G.E.'s new 200-amp engine-drive welder, it's not necessary to buy more expensive, higher rated machines for pipeline, light construction, or job-shop work. This field-tested welder gives you steady output and 100% arc stability, hour-after-hour, even when operated *above* full load.

Test this powerful new welder yourself, and see the many advanced design features—new slow-down control, extra-rugged construction, and many others. Contact your nearby G-E Welding Distributor today. He's listed in the yellow pages of your phone book. Section 714-3, General Electric Co., Schenectady 5, New York.



EXTRA-STURDY construction is shown in this demonstration. Five nickels stand on edge while welder is operated at full load.

GENERAL ELECTRIC



Johnson 50 to 125-yd. Roadbuilders plants

Flexible All-Welded Roadbuilders Bin gives you a portable batch plant for 2, 3 or 4 aggregates, or converts to transit-mix (shown) or central-mix plant for bulk cement and 2 or 3 aggregates. Can be equipped with 1 or 2 multiple material Hi-Speed Batchers, size 34 Roadbuilders Batcher, or truck-mixer charging batcher in 2 to 5 cu. yd. sizes. Bin available with 2, 3 or 4 compartments, 50 to 125 cu. yds. Also: silos, elevators, buckets.

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(Koehring Subsidiary)



7-second discharge with Kwik-Mix 11-S

Saving important seconds on every batch of concrete, tilted Flow-Line Discharge Chute pours full 12.1 cu. ft. batch in 7 seconds. Kwik-Mix 11-S Dandie® also has side or end discharge, 2 or 4 wheels, and special tower attachment. Other sizes: 3½-S to 16-S. Also check Kwik-Mix bituminous, tilt and non-tilt plaster-mortar mixers . . . and Moto-Bug® (power wheelbarrow) shown here. Ask your Kwik-Mix distributor for all facts.

KWIK-MIX • Milwaukee, Wis.
(Koehring Subsidiary)



25 feet per minute with 150 Trenchliner®

On drainage, irrigation and utility trenching, 150 wheel-type Trenchliner digs 16 to 26 inches wide, at depths to 5¾ feet. Hydraulic wheel-hoist maintains close grade tolerance. 30 digging feeds range from 12 inches to 25 feet per minute. Has square or round-bottom buckets; gumbo lips or "Tap-In" teeth; 16 or 12-inch crawlers; gas or diesel power. Tile box and chute optional. Parsons line includes 5 other models, all sizes and types.

PARSONS • Newton, Iowa
(Koehring Subsidiary)

T13-L





2,651 TONS OF STRUCTURAL STEEL are going into this 11-span continuous-girder viaduct, supported by heavy concrete piers. When completed, the 1,483-foot overhead roadway will have 4½-inch steel grid flooring, filled and covered with concrete 5 inches thick. Koehring 1005 crane, with 70-foot boom, handles the heavy lifts—30-foot jib gives extra reach.

How much will it lift?

Check Koehring lift capacities:

205 CRAWLER	(½-Yd.)	20,000 lbs.	30-foot boom at 10-ft. radius
205 ON RUBBER	(½-Yd.)	30,000 lbs.	25-foot boom at 12-ft. radius
304 CRAWLER	(¾-Yd.)	27,800 lbs.	35-foot boom at 12-ft. radius
304 ON RUBBER	(¾-Yd.)	50,000 lbs.	30-foot boom at 10-ft. radius
405 CRAWLER	(1-Yd.)	40,000 lbs.	40-foot boom at 12-ft. radius
605 CRAWLER	(1½-Yds.)	72,300 lbs.	50-foot boom at 12-ft. radius
1005 CRAWLER	(2½-Yds.)	159,000 lbs.	50-foot boom at 12-ft. radius

KOEHRING COMPANY, Milwaukee 16, Wis. (Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load.)



JOB IS A MAZE of odd-shaped ducts, returns, buttresses and slabs built at grades varying to 47 ft below ground. Complexities of $3.9 million Dalecarlia Pumping Station calls for tight scheduling by contractor to avoid $300-a-day job completion penalties.

It's Tough to Make a Big Pour

A HEADS-UP concreting operation is making it possible for the contractor to meet a tight schedule on a complicated Washington, D.C., building job.

The job is the $3.9 million Dalecarlia Pumping Station which William E. Cramer Co., Washington, is building under supervision of the U.S. Army Corps of Engineers.

Complexities of the job mean slow and costly concrete handling. But Cramer has been able to meet his schedules by pin-point planning. The firm faces $300-a-day penalties for job completion.

Dalecarlia measures 205x101 ft. It is a 26,000-yd pour job and loaded with design features which call for special concrete handling. The job is a maze of odd-shaped ducts, returns, buttresses and slabs, almost all 47 ft underground. These are headaches to layout men and make large-scale concreting out of the question. One concrete pour may go to the north side of the job; the next, to the south. And design requires 12 separate concrete mixes.

Keeping things moving is Cramer's superintendent, Robert Argenbright. Argenbright stays close to sections being readied for pours. When concrete is needed, he checks specifications for the desired mix and phones his batch plant operator with Connecticut electric inter-job phone.

The batch plant is a C. S. Johnson mounted on concrete footings at the job's highest level. Housed beneath two 35-ton hoppers for sand and gravel is a Johnson automatic batching and recording set up. The operator sets his dials for the desired mix, presses a few buttons, and concrete mixing begins.

The hoppers automatically dump the correct amount of sand and gravel into a 2-cu yd mixer on the second level of the plant. Cement from a 1,200-bb silo is conveyor-belt-fed into the mixer, followed by water either from tanks near the mixer or from a heating unit.

Capable of turning concrete out at a rate of 50 cu yd per hr, the mixer dumps into a Rex 200 Pumpcrete machine, and within a short time concrete is sent through pumpcrete pipes to the desired location.

Where feasible, Argenbright supplements pumpcreting with ramps and buggies. And when he can, he breaks up a pipe section and diverts concrete by gooseneck into a hopper for distribution by buggies. This cuts down on the number of pipe relocations.



WORKMEN RUN pumpcrete line to hard-to-get-at foundation for water duct. Contractor sometimes pumpcretes up to 1,000 ft.



GOOSENECKING CONCRETE into hopper where it is picked up by buggies cuts down on time-consuming relocation of pumpcrete pipes.

Bit by Bit

Live steam and hot water are kept on hand in case of a sudden freeze, not unknown in the usually mild District of Columbia. Source of supply is a Model C Kewanee boiler, oil-burner heated, which can fire up to 15 lb of live steam through pumpcrete pipes.

The steam warms the pipes and blows out any blocking ice pockets. The same unit, housed in a small shanty alongside the plant, also supplies hot water for aggregate warming to prevent poured concrete from freezing.

A job-made water and air jet is used to wash away concrete laitace and provide a bond between pours. The air jet also comes in handy to help sweep forms clean prior to pours. The jet consists of a 6 ft length of ½-in. pipe flattened on one end to a chisel point. This fans 90 psi air pressure supplied by a LeRoi diesel-operated single-stage compressor. Water for the system is distributed by a simple nozzle and hose system.

Resident engineer for the Army is S. E. Neely, working under the jurisdiction of Col. Ray Adams, District Engineer, who supervises the supply division, Washington District Corps of Engineers.



CLAMSHELL DUMPS sand into one of C. S. Johnson batch plant's two 35-ton hoppers while Allis-Chalmers HD-9 stockpiles gravel.

AUSTIN-WESTERN
CRUSHING EQUIPMENT
Engineered for

- HIGH OUTPUT
- CONTINUOUS OPERATION
- MINIMUM MAINTENANCE



Stationary Plant working a slag pile producing railroad ballast.

The Austin-Western line includes Jaw Crushers and Roll Crushers in many sizes; plus matching Screens, Elevators, Conveyors and Bins.

Exclusive design features and high operating speeds increase crusher output. Continuous operation and minimum maintenance expense are assured by the skilled engineering and sound manufacturing that characterize every Austin-Western Crushing and Screening Plant.

Each plant is designed to solve a particular production problem. We would welcome the opportunity to discuss your problem.

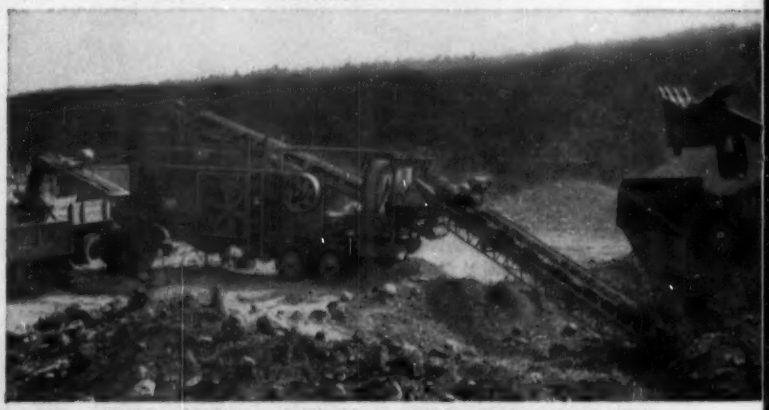
See your nearby Austin-Western distributor today . . . or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.



15 cu. yd. Portable Bin and Screen Unit, ideal for producing specification material.



61E Portable Plant equipped with 10" x 24" Jaw Crusher, 24" Plate Feeder and 2' x 6' double-deck Screen.



201E Portable Plant equipped with 10" x 24" Jaw Crusher, 24" x 16" Roll Crusher and 3' x 10' Screen.

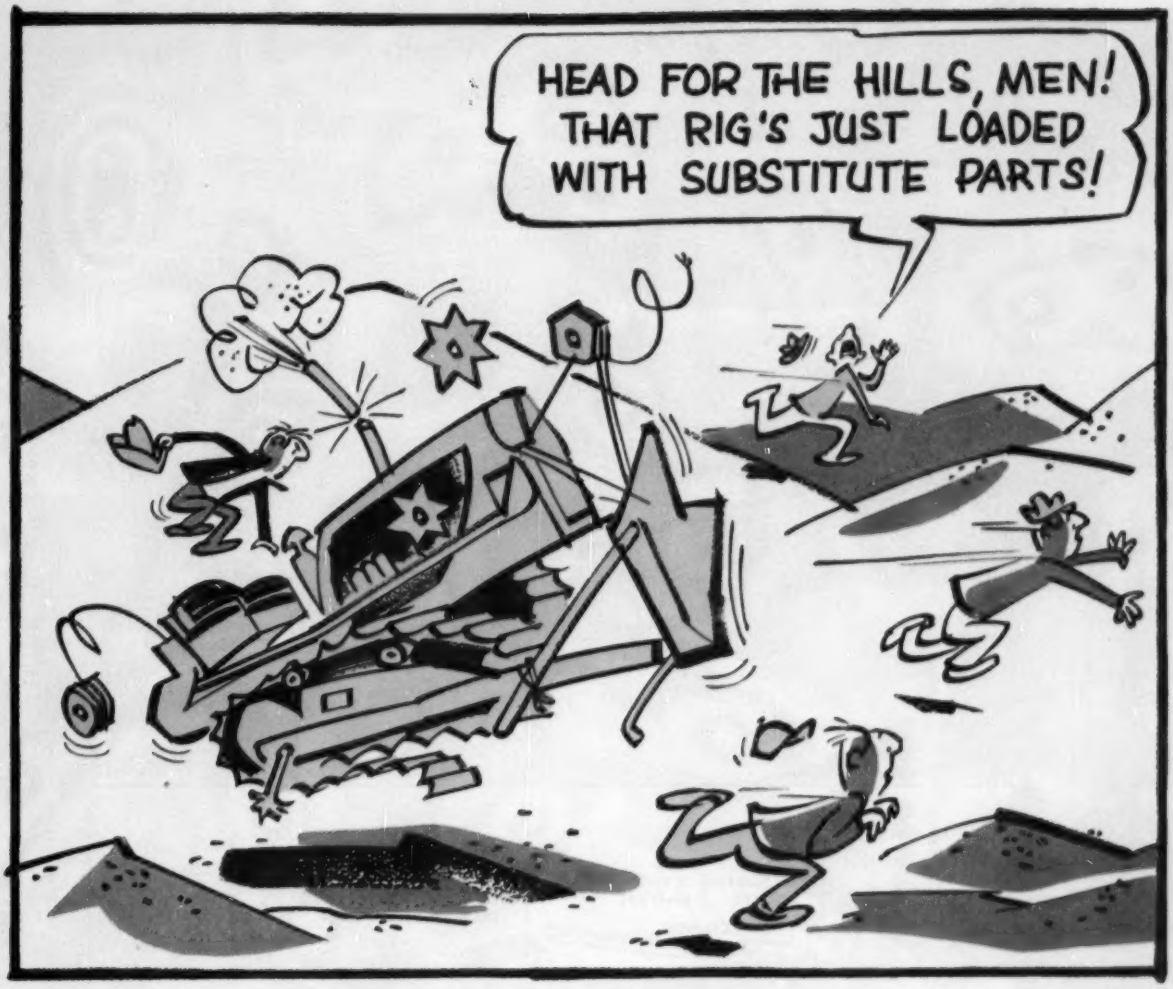
Stationary Plant producing 2 sizes of sand and 2 sizes of washed gravel.



Distributors in Principal Cities of the world

AUSTIN-WESTERN
CRUSHING, SCREENING & WASHING EQUIPMENT

BALDWIN-LIMA-HAMILTON
Construction Equipment Division
LIMA, OHIO, U.S.A.



Best place to head for is your Caterpillar Dealer.

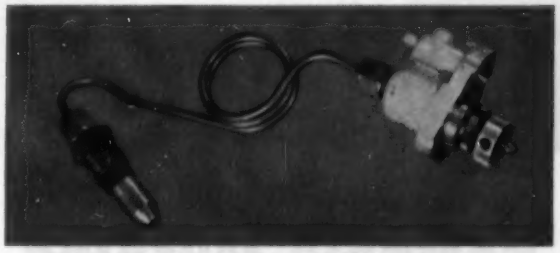
If the trouble's with substitute fuel injection parts, you should know this:

Original Caterpillar fuel pumps and injection valves are made from very special steel — the finest chromium alloy ball-bearing type. They're made with special tools in a special factory—only one of its kind in the world. Each pump is pre-set and given a 6-hour run-in. Single orifice design of valve cuts down possibility of fouling. In short, with Caterpillar parts you're sure of better performance, less down time.

With substitute parts, can you be sure of anything?

Better get Caterpillar original parts every time.

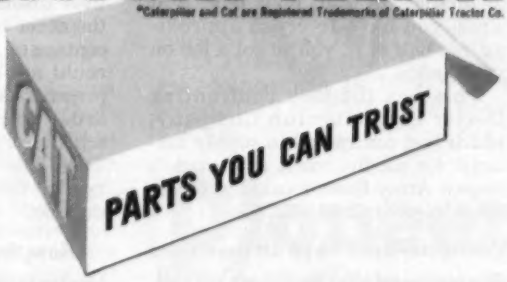
Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

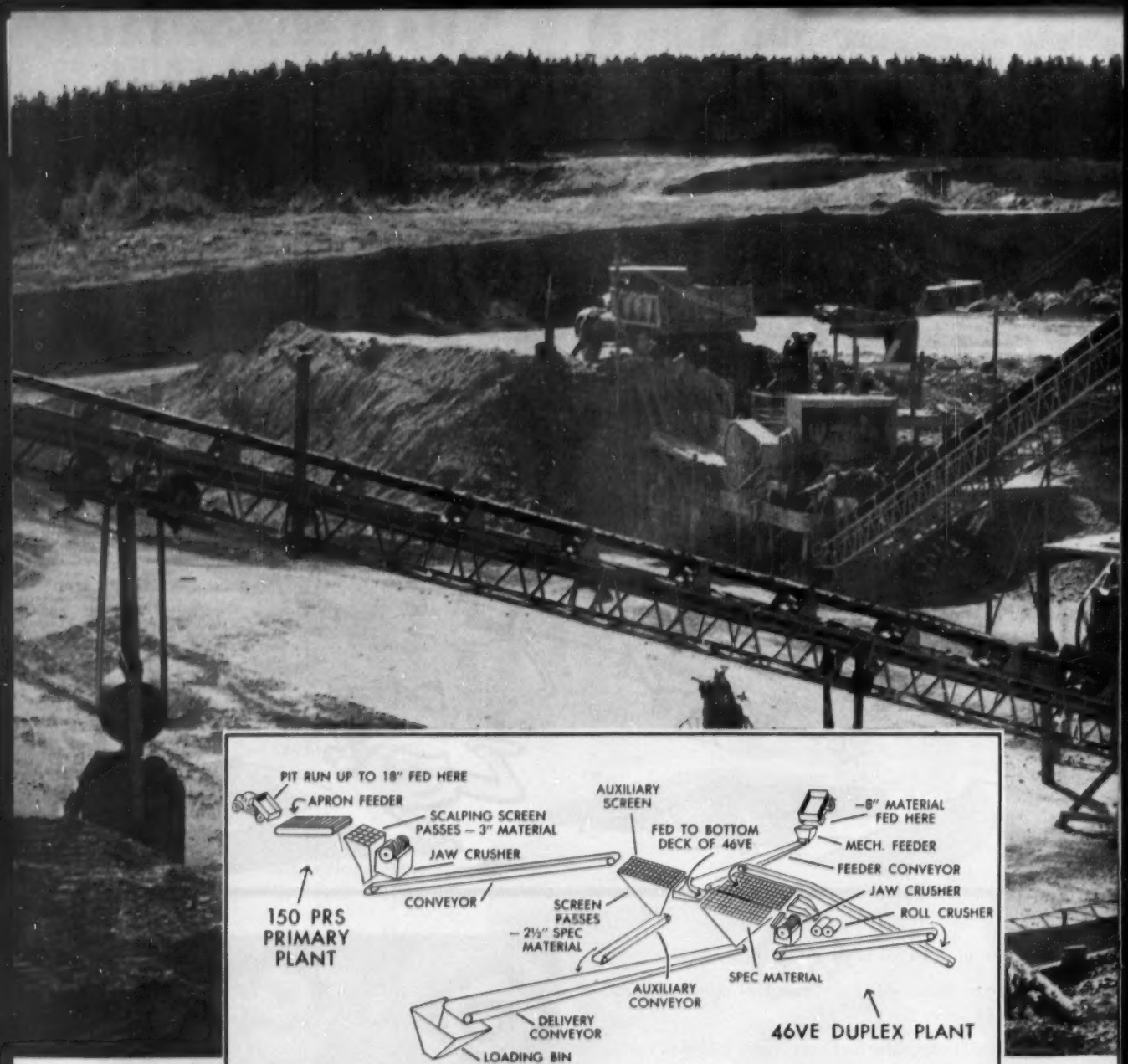


With clean fuel, CAT* fuel injection valves and pumps can last 20,000 hours and more. They are 100% interchangeable among cylinders of same engine or like models.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.





Portable crushing setup produces 5000 tons per day under freak pit conditions

● 5,000 tons is a lot of 2½" material to produce in a 10 hour day. And when you have to crush approximately half of it, you've got a job on your hands.

This was the task confronting Dexter Construction Company, which had contracted to supply material for all the roads at Canada's largest Army Base, located at Gagetown, New Brunswick.

Contractor finds freak pit conditions

Dexter found that half their pit consisted of material ranging from sand to 8" rock. This was swell, but to their dismay, they discovered that the other half contained a high percentage of 15" to 18" boulders. These could not be crushed with Dexter's presently owned equipment, yet in order to maintain road building schedules, *all* pit material had to be used. The problem was how to obtain the fastest, most economical production.

How the problem was solved

Dexter overcame this threatened production bottleneck by installing *two* portable crushing plants. One, a PIONEER Model 150 PRS Primary plant handles material from the part of the pit which contains the boulders.

The other, a big PIONEER 46VE diesel-electric Bottom Deck Feed plant, takes the 8" maximum material from the remainder of the pit *and at the same time, serves as a secondary plant for the 150 PRS.*

By an ingenious arrangement of materials flow, output of *both* plants is delivered to a common loading point via the same 36" x 105'



PIONEER Conveyor.

Working in conjunction, these two plants utilize all pit material and produce the necessary 5,000 tons in a 10 hour day.

Why the 150 PRS was chosen

After careful study, Dexter picked the 150 PRS for the job because its scalping screen and big 2036 jaw crusher enables it to handle large rock and at the same time, maintain unusually high output. The two-deck screen located ahead of the jaw crusher, removes material under 3" so that the jaw handles only rock needing primary crushing.

How these plants team up

Crushed material from the jaw in the 150 PRS primary plant, plus the by-passed materials, are separated and sized by a 5 x 12 two-deck auxiliary screen located between the two plants. Specification material is removed here and conveyed to the loading bin.

Material in need of further processing is then fed to the *bottom deck* of the 46VE *along with pit run material containing the 8" maximum rock.*

How Bottom Deck Feed works

With bottom deck feed, specification sizes are immediately removed. Oversize goes to the jaw crusher, then to the top deck where specification sizes are again removed. Oversize from the top deck is sent to the roll crusher for final reduction. This exclusive Bottom Deck Feed feature provides *twice* the effective screen area and thereby increases output. In addition, the operator can easily equalize loads carried by the roll and jaw crusher, *while the plant is operating,* thus always keeping the plant at peak crushing capacity regardless of changes in size of materials. This feature also permits closer gradation control.

For information on PIONEER'S new Model 150 PRS Plant and 7 different sized Bottom Deck Feed Plants, write Pioneer Engineering Works, Inc., Minneapolis 13, Minnesota (a subsidiary of Poor & Company, Chicago).

Pioneer
Continuflo EQUIPMENT



CONCRETE for tank wall is built up around reinforcing parts by True Gun-All placing system. Weighed amounts of aggregate are conveyed to dual-chamber tank, where water is added, batch is mixed, and blown through hose. No water has to be added at nozzle.

New Idea in Air Placing:

Tank Mixes Concrete, Then Blows It

A NEW TYPE air placer mixes controlled amounts of aggregate, cement, and water in a dual-chamber tank, and then blows the mix to a gun, one chamber at a time. According to the manufacturer, True Gun-All has the following advantages over conventional equipment:

- **Controlled water-cement ratio**
- **Less than 5% rebound**
- **No sand pockets**
- **Only 125 cfm air required**
- **No separate mixer required**
- **Sand may contain up to 25% moisture.**

Here's how the unit works · Weighed amounts of aggregate up to ⅜ in. and cement are dumped into one of the 7-cu ft mixing chambers. The exact amount of water is added by a metering device, the material is mixed, and then blown through a hose. With a special nozzle, a workman applies the wet mix to the proper area. With certain types of mixes, a stream of high-pressure air is fed into the nozzle to boost adhesion.

Dual mixing chambers provide continuous operation. One chamber is loaded as the other is worked. A Siamese valve easily switches flow. Production is said to average about 3 or 4 cu yd in place per hr.

Manufacturer is True Gun-All Equipment Co., Midstates Building, Tulsa, Oklahoma.



DUAL-CHAMBER TANK handles two batches alternately. Mixing blades are powered by Wisconsin engine. Meter controls water.



NOZZLE sprays concrete around reinforcing bars, leaving no sand pockets. Air is sometimes added at the nozzle to boost adhesion.





RUGGED WAGNER EQUIPMENT

makes a tractor your most versatile and inexpensive construction tool

Now a tractor can be the most important single tool on your construction jobs. When it's teamed up with rugged Wagner tractor equipment, nothing else can do so many jobs so well.

By equipping a tractor with a Wagner Backhoe you make short work of digging footings, sewer, gas and power trenches and septic tanks. Likewise a tractor and a Wagner loader do a faster, better job of land clearing, excavating, backfilling and landscaping. And all the while you'll be speeding construction, saving man-hours and increasing profits.

Check with your nearby Wagner dealer to see how Wagner tractor equipment can cut time and labor costs on your construction jobs.

wagner
TRACTOR EQUIPMENT

WAGNER IRON WORKS, 1905 South 1st St., Milwaukee 1, Wis. Dept. 11

Send me more information on Wagner Tractor Equipment for a ..... (make) tractor.

NAME .....

COMPANY .....

ADDRESS .....

CITY ..... STATE .....

"WAGNER BUILT" MEANS "BETTER BUILT" FOR OVER 105 YEARS



Gar Wood-Buckeye 308 digs to 5 feet 6 inches deep, with optional cutting widths from 16 to 32 inches in 2-inch steps.

These high-production features put Gar Wood-Buckeyes far ahead

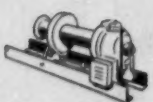
Simplified Group Controls... with panel-mounted conveyor and hoist controls, foot-operated steering controls. Control arrangement simplifies use by experienced operators, speeds the "breaking-in" of new operators.

Unit Construction provides interchangeability of major components and assemblies of all three new models.

Tapered Rooter Bits fit *inside* holders, are pitched for proper bit angle and bucket heel clearance. Last longer . . . can be replaced easier and at a much lower cost.



Gar Wood Truck Cranes



Gar Wood Winches



Gar Wood Excavators

GAR WOOD

Wayne, Michigan

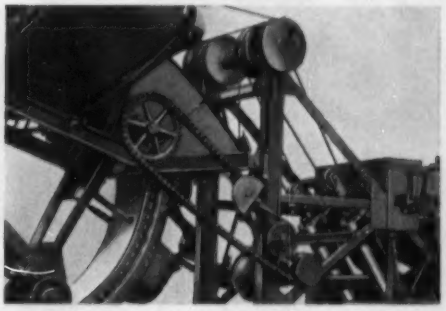
Plants in Wayne and Ypsilanti, Michigan;

Advanced hydraulics boost production with Gar Wood Buckeye ditchers

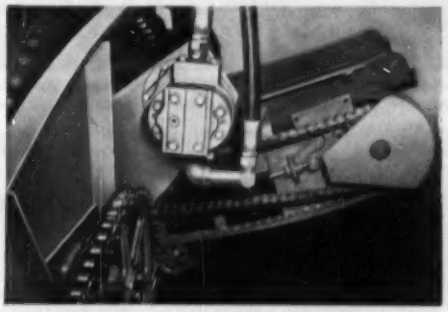
Once again, in three new job-proved ditchers, Gar Wood-Buckeye brings you advanced features that boost ditch production, cut ditching costs!

First, an *exclusive live hydraulic wheel hoist* provides faster, more accurate positioning of the digging wheel. Next, *exclusive hydraulic conveyor drive* provides three discharge speeds in either direction . . . instant adjustment to handle any volume of spoil independent of any other function. No complicated shifting, no need to stop digging wheel or crawlers. Both wheel hoist and conveyor drive are operated independently of each other and from the operator's seat. *Tractor-type crawlers* on these new Gar Wood-Buckeye models are strong and reliable . . . assure trouble-free service.

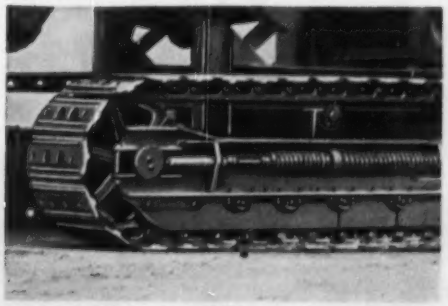
These and other Gar Wood-Buckeye features mean smooth, clean, low-cost ditching . . . more ditch per dollar with the greatest return on your capital investment. They also mean longer life, less maintenance and less downtime. They explain why contractors expect and get *more* for their money in Gar Wood-Buckeye ditchers. See for yourself by asking your dealer to show you these new job-proved models: the 305, 307 and 308. And, while you're there, find out about the full range of factory options that tailor these ditchers to *your* particular applications and digging conditions.



LIVE HYDRAULIC WHEEL HOIST positions digging wheel faster, more accurately. Digging wheel is positioned independently of all other operations. Operated from seat by simple, one-hand controls.



HYDRAULIC CONVEYOR DRIVE eliminates shock damage . . . requires less maintenance. Three discharge speeds in either direction meet any conveyor need. Completely controllable from the seat.



TRACTOR-TYPE CRAWLERS, with face-type roller seals, give long, trouble-free service life. Simplifies variation in tread width and bearing areas through a selection of pads for any type digging.

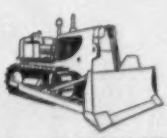
INDUSTRIES, INC.

Findlay, Ohio

Findlay, Ohio; Mattoon, Illinois; Richmond, California



Gar Wood-Buckeye Spreaders

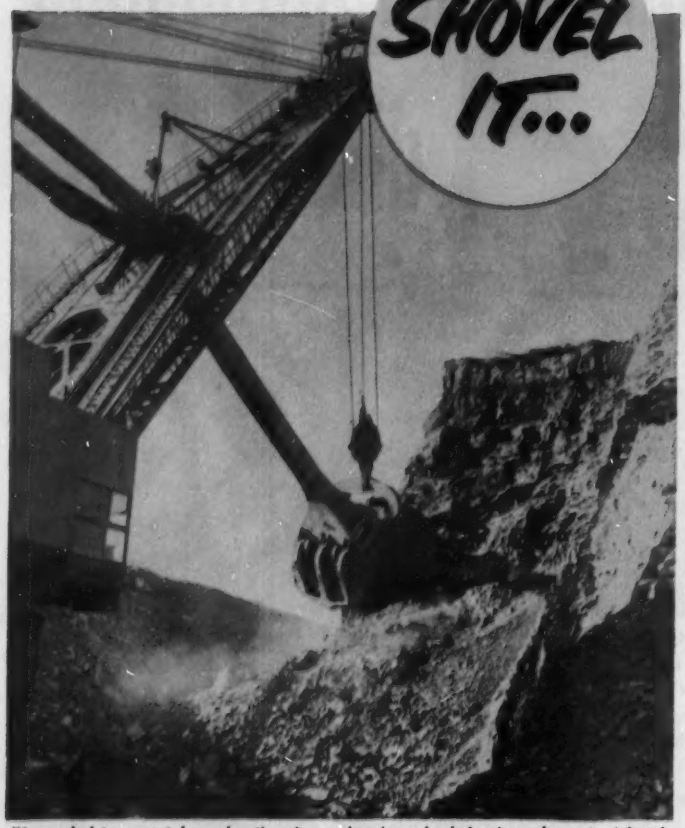


Gar Wood Tractor Equipment



Gar Wood-St. Paul Hoists & Bodies

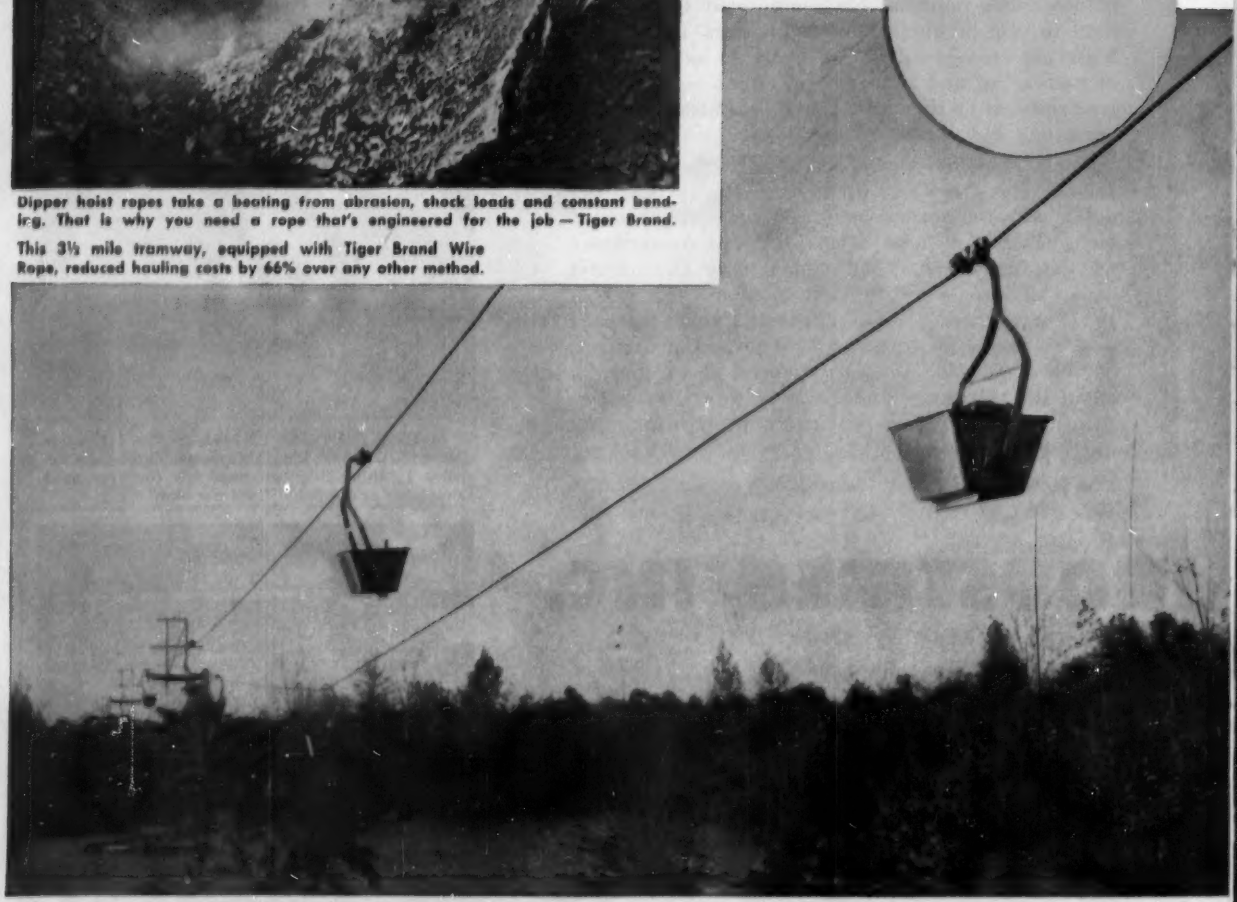
WHETHER YOU SHOVEL IT...





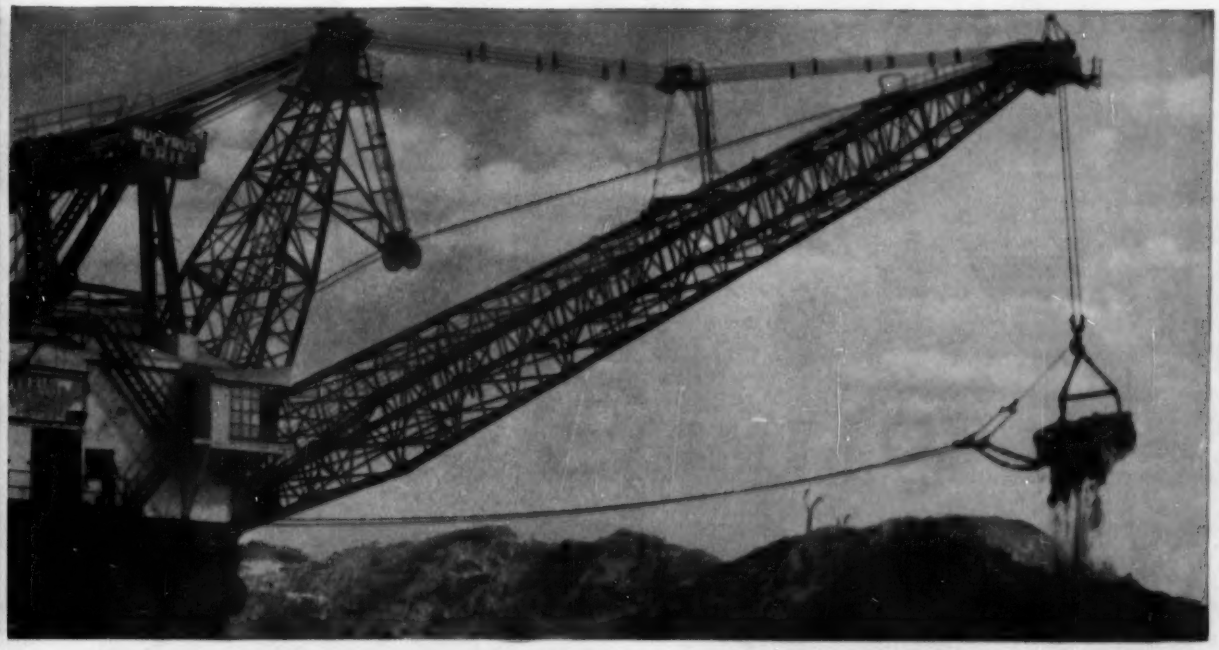
DRAG IT...

OR HAUL IT



Dipper hoist ropes take a beating from abrasion, shock loads and constant bending. That is why you need a rope that's engineered for the job — Tiger Brand.

This 3½ mile tramway, equipped with Tiger Brand Wire Rope, reduced hauling costs by 66% over any other method.



Tiger Brand Drag Lines have a reputation for keeping costs down by moving more cubic yards per rope.

BY AIR... Tiger Brand delivers top yardage per dollar spent for wire rope

When you are moving materials in a big way, the cost per cubic yard may be a deciding factor in the type of equipment and wire rope you select. Whether you use shovels, draglines or tramways, the problem is to pick the rope that will give the best possible service on your job.

On shovels, Tiger Brand Wire Rope has run up some amazing records. Tiger Brand shovel hoist ropes are designed to combine flexibility, strength and resistance to abrasive wear as required by this class of service.

On draglines, where a lot of abrasive wear and abuse are encountered, Tiger Brand drag ropes have demonstrated time and again that the right rope for the job is the most economical.

For tramways, Tiger Brand track cables and traction ropes are recognized leaders.

For a personal guide to rope selection, send the coupon.



American Steel & Wire Division
Rockefeller Building, Dept. B-26
Cleveland 13, Ohio

Please send me your Wire Rope Recommendation Book, "The Right Rope for the Job."

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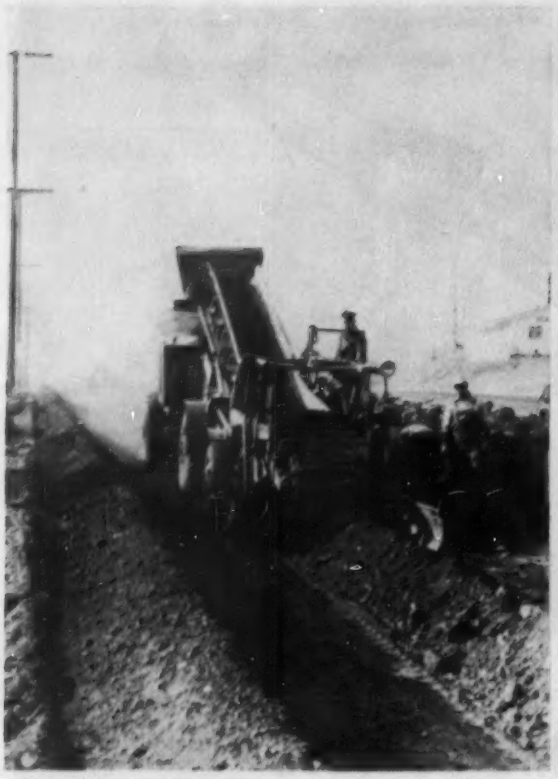
AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
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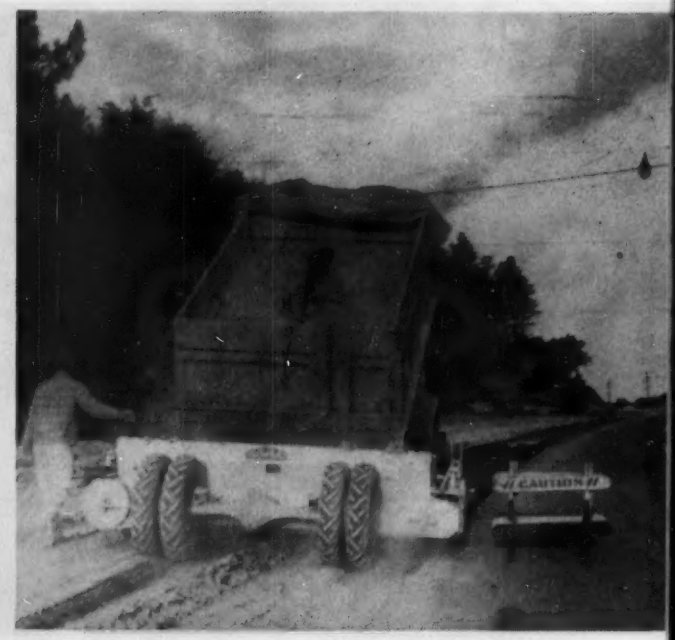
USS AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

USS

UNITED STATES STEEL





IMPACT BREAKER towed by Athey loader (left) crushes select granular subbase material and dumps it behind to be bladed. Hercules spreader (above) applies cement to surface, and Seaman-Andwall Trav-L-Plant (right) follows to mix material dry. Connected to water truck, Trav-L-Plant applies 200 gpm of water on second pass. Third pass, without water truck, completes mixing.

In-Place Crushing and Mixing

GRANULAR MATERIAL crushed in place, bladed, covered with cement and mixed with water is making top-grade subbase for a California highway.

It's a fast operation. Crews of Schroeder & Co., Sun Valley, Calif., complete 5,000 sq yd of subbase a day. And they have to contend with traffic and utilities. They are widening a 5-mi stretch of a Los Angeles area highway from 30 to 80 ft. The $611,000 job is under the supervision of the California Division of Highways.

The job consists of ripping out bituminous shoulders along each side of the old pavement, building necessary widening areas with grading equipment, cement treating 6 in. of granular subbase material along both sides of the old pavement, placing 4 in. of asphalt plant mix over this base course, and resurfacing the old slab with 2 in. of plant-mix asphalt.

Earthmoving quantities are not heavy, and only in a few places where decomposed-granite rock outcrops stand in the way are minor drilling and shooting necessary. This is held to a minimum because of proximity to residential districts. In most cases, a heavy-duty single-tooth ripper moved all but the most solid material.

Compaction requirements on the earth subgrade are of the same high-type which California Division of Highways uses on freeway construction. To develop the required densities, earth is placed on the fill in 6-in. courses. Optimum moisture is achieved with two 2,000-gal water trucks that haul from fire hydrants nearby. Each lift is compacted with at least eight passes of a Southwest sheepsfoot roller ballasted with sand and water to 400 psi.

Subbase specifications call for 2½-in. maximum stone. Select granular material is available within the cut limits. It is necessary only to dig and windrow the upper 6 in. of this material, and then pass it through crushing equipment. The machine selected for this work is an Athey Speedloader which moves along in a single operation, picking up the windrow on its input belt, passing it through an impact breaker and leaving it laid out behind ready to be rebladed and rolled. Production on this item averages 50 cu yd per hr.

Next operation is the treatment of 6 in. of subbase material with 2½% by weight of portland cement. Construction strips outlined for this operation varied from 23 to 44 ft wide and averaged about 400 ft long. California's specifications call for prompt mixing and compaction after cement and water have been introduced.

When a section has been leveled and made ready for this treatment, bulk portland cement is hauled in. Transfer trucks dump cement into a Hercules spreader, whose metering box is set to deliver precise percentages of material. Bulk cement is laid down over the subbase in a flat strip just ahead of the mixing.

To develop a good blend, an initial dry-mixing pass is made first by the Seaman-Andwall Trav-L-



Produce Quality Subbase

Plant, whose rotor and tines are set accurately for the exact 6-in. mixing dip required. After this first pass the machine then moves through again, hooked to a water tank truck, applying approximately 8½% moisture through pump and meter at a rate of about 200 gpm. During this pass also, the machine mixes the subbase. An additional mixing pass without watering gives the base secondary mixing.

Rollers followed closely. An initial compaction pass is delivered by a Buffalo-Springfield three-wheel steel machine ballasted to 12 tons. Then follows a pneumatic-tired roller which the contractor made from a Galion tandem stock-model machine. The steel wheels were taken off this unit and large rubber tires substituted. It weighs 1,600 lb per tire and delivers excellent pneumatic compaction. Its chief function is surface compaction to leave a smooth, dense subbase. Only a minor amount of tight blading by a motor grader is necessary to leave the subbase smooth and tight. An asphalt distributor application of from 0.15 to 0.25 gal per sq yd of SC2 prime coat asphalt leaves the subbase in shape to handle traffic until the pavement can be laid.



PNEUMATIC-TIRED roller is contractor-modified Galion unit. Steel wheels of standard rig are replaced with rubber tires. It produces a smooth subbase surface.

Despite difficulties, excellent performance records are noted. It is not uncommon in a day's time for the Seaman Trav-L-Plant to complete 68,500 sq ft of cement-treated base.

John Sawyer is superintendent, and John Hayden is chief estimator for Schroeder and Co. Kenneth Mock is resident engineer.



Uranium miner, James T. Gray looks over his Le Roi Model 210 Airmaster compressor, which cost him only 40¢ for repairs last year.

View of James T. Gray's uranium mine located far back on Colorado Plateau. Le Roi Model 210 Airmaster compressor, shown in background, provides air power for operation.

How 55% of Uranium Miners On Colorado Plateau Cut Air-Power Costs

One miner spent only 40¢ on compressor repairs in year.

Use of LPG fuel means additional savings in time and money.

Latest reports show that 55% of the compressors sold on the Colorado Plateau are Le Roi — the dependable air compressor. Le Roi-Cleveland air legs and rock drills were also selected to help keep costs down on most of these uranium projects.

Take the case of miner James T. Gray, for instance. Even though he's a long way back in the mountains, far from repair parts, downtime and distance don't worry him. One reason is that last year he spent only 40 cents for repairs on his major source of power—a Le Roi Model 210 Airmaster Compressor.

Six cents a gallon fuel savings provide another cost-cutting factor at Jim Gray's uranium mine. This large saving is possible because he runs the Le Roi compressor on liquid propane gas. In a year, the six-cents-per-gallon saving grows into a respectable total.

Dependable fuel supply and bulk purchases give miner Gray further dollar savings. To eliminate dangers of being cut off from fuel supply, he installed an LPG storage tank and hooked it directly to the air compressor. Once a month he fills the storage tank with LPG fuel. From this supply, he gets a steady, reliable flow of fuel for at least 30 days — an important advantage on mining projects far back on the craggy, Colorado Plateau. It's time saving, too, because it eliminates the need for daily refueling of the compressor tank.

Both the engine and compressor in the Model 210 Airmaster are manufactured by Le Roi. This assures you complete dependability and more economy. Le Roi Airmaster Compressors also have removable, copper-finned, individual radiator and intercooler core sections, for efficient cooling under all operating conditions. 100% interchangeable valves are readily accessible for quick, easy maintenance.

Le Roi Division of Westinghouse Air Brake Co., Milwaukee 1, Wisconsin also manufactures Tractair and stationary air compressors, air tools, and engines. Write today for information about any of these products.

C-168



Less Shifting, Less Maintenance with this

CLARK PACKAGE UNIT

Torque Converter and Transmission Integral

Operating advantages are clear and exceedingly profitable, when you use a Clark Package unit

- **vastly reduced shifting—less fatigue**
- **smooth flow of power regulated to engine's most efficient speed —3-to-1 multiplication factor builds up torque to meet need**
- **reduced shocks: longer life for all gears, shafts and engine**
- **greatly reduced maintenance on entire power-train**

A Clark to meet your need—Clark's broad line (15 to 600 hp—11" to 26" diameters) assures a size and capacity for every power-transmission requirement.

You can do as several leading manufacturers are doing: Take advantage of Clark's unique experience in the basic field of torque transmission—from flywheel to point of use—to get more useful power at less cost. Any problems?—talk to Clark.

Start by sending for the Clark Torque Converter Bulletin—a helpful statement on torque multiplication.

CLARK® EQUIPMENT

Clark Equipment Company
Jackson 6, Michigan
Please send set of Clark Torque Converter Bulletins.

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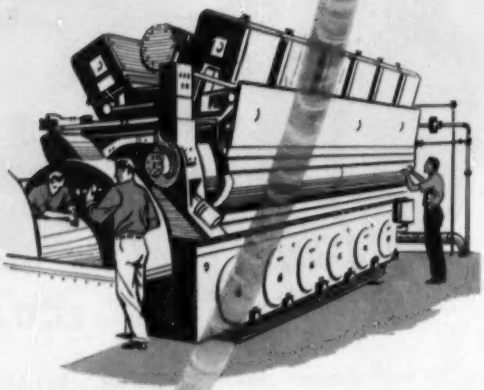
CITY_____ STATE_____

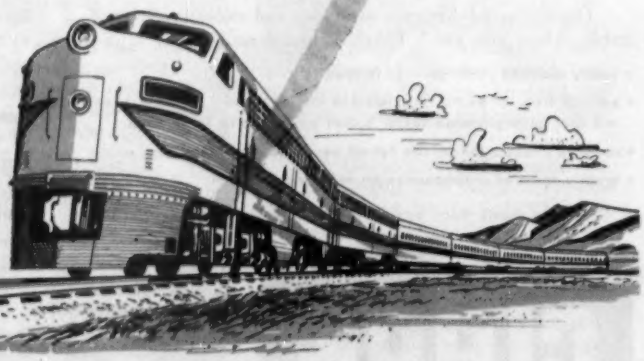




MORE DRIVE for your diesel!







Here is how the application of AiResearch Turbochargers can affect the performance of your mobile or stationary diesel equipment:

✶ Adds more power in relation to size and weight than any other units in this field.

✶ Decreases fuel consumption. Besides decreasing costs, this factor greatly increases the non-refueling range for mobile equipment.

✶ Provides power as needed by responding rapidly to acceleration requirements. This factor greatly decreases smoking.

✶ Maintains sea-level power under all altitude conditions.

✶ Greatly reduces the noise level of your equipment while eliminating power-wasting mufflers.

AiResearch is the largest producer of small turbomachinery in the United States. Twenty-five *million* hours of experience in deriving exceptional power from small units is the background for the development of the AiResearch Turbocharger. This power package was recently applied to Caterpillar diesel machinery with startlingly effective results.

Your inquiries are invited.

THE GARRETT CORPORATION

AiResearch Industrial Division

9225 Aviation Blvd., Los Angeles 45, California

DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND RELATED MACHINERY



HYBRID DITCHER digs coral rock on excavation job for storm drain. Main body of big machine consists essentially of two crawler tractors set one above the other, with the upper unit's running gear removed. It is operated by one man and one helper.



STRAIGHT-SIDED TRENCH 28 in. wide and 17 ft deep is cut by offset digging ladder. For wider ditch, rig makes multiple passes.

Two Tractors Make One Ditcher

By HENRY T. PEREZ, Editor

BY CANNIBALIZING parts from two tractors, a Florida engineer has put together a unique and efficient ditching machine. The 50-ton rig will dig some rocks that normally would have to be blasted, including many of the limestones. And with the hybrid machine, a Miami contractor is cutting a 28-in. by 17-ft ditch for a storm drain through a somewhat softer coral rock at speeds up to 100 ft per hr.

The ditcher is the brainchild of Selden L. Stewart II, of Coral Gables, who started out with a pair of Caterpillar D8's. He took the engine out of one tractor, but left the transmission, frame, and running gear intact. On top of and projecting slightly forward from this unit, he mounted the second tractor, after first removing its running gear. From parts

200 to 400
TONS PER HOUR!

when it gives
Production like this—

IT'S A CEDARAPIDS COMMANDER

Wherever you see a portable aggregate plant producing 200, 300 or 400 tons per hour, day after day and month after month, with low, low operating costs — chances are it's a Cedarapids Commander!

The plant shown below, owned by P. O. Pederson of North Branch, Minnesota, is turning pit run gravel (with crushing 15% and up) into ¾" and 1" aggregate at a rate of 200 to 300 tons per hour. Other producers report as high as 400 tons per hour production!

The big, *balanced* production of crushers, horizontal screen and conveyors is the secret of the Commander's high tonnage output. Cedarapids-Quality construction is the secret of low maintenance and operating costs.

There's sure to be a Commander working near you. Watch it produce — ask the owner for his opinion — then call your Cedarapids distributor for additional information.

Cedarapids Built by IOWA

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U. S. A.



COUNTERWEIGHTED FRAME holds digging ladder that extends down to rear of machine. Angle of ladder determines depth of cut, which can be varied up to 19 ft. Diesel engine in upper tractor unit is rig's sole power source; there's no engine in lower unit.

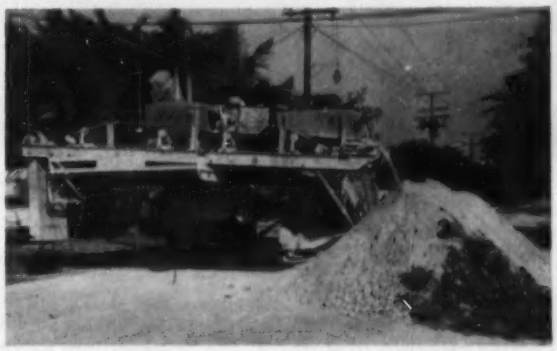
of this undercarriage he fabricated the ditcher's ladder. And he fastened the ladder to a counterweighted frame so it extends downward to the rear off the left side of the machine.

All power for ditcher operation comes from a Cat D337 diesel engine with torque convertor in the upper tractor unit. The engine works through this unit's regular transmission, with power supplied to the digging-bucket line by chain drive from the left-hand final drive shaft. For fast travel speed (while not digging) power is transmitted from upper transmission to lower transmissions by multiple V-belt drive between pulleys on their respective power-takeoff shafts.

All other operations of the ditcher are hydraulically powered. For this, pressurized oil is supplied by a Vickers pump that also is driven by the machine's single engine.

In the engine space of the lower tractor sits a 15-hp hydraulic motor that drives the crawler tracks at creeper speed while digging. It works through a 100 to 1 reduction gear to the lower transmission. Travel speed, and thus crowd pressure of the bucket line, can be pre-set hydraulically. If the digging slows when hard spots are encountered, pressure builds up and automatically reduces or stops the machine's forward movement until the tough section has been cut through.

A counterweighted steel-frame yoke holds the upper end of the ditcher ladder. The yoke is pinned to side frames on the dual-tractor unit by two trunnions from D8 dozer arms. Because the trunnions are set in line with the upper final drive shafts (one



TRANSVERSE CONVEYOR is reversible, can be shifted and raised for loading trucks. This spoil later will be replaced in trench.



DITCHER'S DESIGNER, Selden L. Stewart II, watches machine resume digging after the ladder was raised to clear a buried pipe.



HYDRAULIC RAMS raise yoke frame and attached ladder. Mul-from power takeoffs so main engine can drive crawlers at normal tiple V-belts connect upper and lower transmissions through shafts tractor speeds. Hydraulic motor supplies creeper digging speed.

of which powers the bucket line) the yoke can be rotated without disturbing the bucket-line drive mechanism. Two Hercules telescopic hydraulic rams, originally built for dump-truck bodies, rotate the yoke. This adjusts the ditcher ladder for correct digging depth or raises it clear of the ground for moving from site to site.

Stewart made the digging ladder from parts taken from the unused crawler assemblies of the ditcher's upper tractor. The two track roller frames, for example, are incorporated into the 24-ft ladder frame. One crawler idler is at the lower end of the ladder; its companion drive sprocket is at the upper end. Between them are the tractor's four carrier rollers (on the frame's top side) and its twelve track rollers (underneath). On these ride the two extra crawler tracks. They are joined end to end, with track shoes removed, and act as a chain to carry 28 digging buckets.

Buckets are fitted with short, flared, detachable teeth that dig in and cut the rock. But they do not penetrate far enough to stall the bucket line or make it difficult to steer the off-center machine.

As the bucket flight digs, it dumps excavated material on to a 30-in. belt conveyor attached to the side of the ditcher. This in turn carries spoil forward to a transverse conveyor on the front. The transverse belt, 30 in. wide and 19 ft long, is reversible for dumping to either side. It can also be shifted sideways and one end raised for loading directly into trucks.

Stewart built both conveyors. Carrying cleated Goodrich belting, they are powered by Vickers hydraulic motors hooked to Gar Wood winches that act as drive pulleys.

The Stewart ditcher cuts a slot 28 in. wide and up to 19 ft deep. But because the digging ladder is offset, the machine can cut any width trench by making multiple parallel passes. The ground must be strong enough to support the heavy ditcher about 3 ft back from the edge of the trench without caving.

(Continued on page 101)

New SEAMAN-GUNNISON DUO-PACTOR Handles Both

SEAMAN
...an old name in the soil stabilization field introduces:
A new company
Seaman-Gunnison Corporation
A new product
Seaman-Gunnison Duo-Pactor



Now, two compaction methods in one machine . . . an advantage found *only* in the Seaman-Gunnison Duo-Pactor. Unit offers pneumatic compaction through eight oscillating, spring-mounted wheels and rigid roll compaction to "iron out" the ridges left by rubber-tired rolling. Operator uses either of the two rollers independently or together... hydraulically selective.

In addition, the Duo-Pactor offers these advantages:

- 86 in. pneumatic rolling width; steel roller width 72 in.
- Complete turn-arounds, without backing, on 19-ft roads.
- Widest gross weight range of any roller built . . . 6 to 19 tons, sand and liquid ballasting.
- International "300" prime mover; 4 ft dia. drive wheels for maximum traction.
- Full power hydraulic steering through 180°.

Write today for complete specifications and details.



Spring-mounted oscillating wheels knead road surface.

COMPRESSION in lbs per lineal inch		
	Empty	Fully Ballasted
Steel	104	425
Rubber	94	400
Both Steel and Rubber	50	200
Drive Roll	150	300



SEAMAN-GUNNISON also builds the complete line of Gunnison truck and trailer-mounted Distributors and Flushers.

Seaman-Gunnison Corporation

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HERE'S THE LONG

AND THE SHORT OF IT...





BAY CITY CRANEMOBILE

MAKES ALL LIFTS EASY, FAST, AND SURE

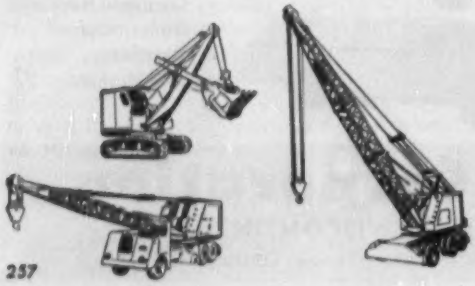


Regardless of boom length or type of job, contractors find that the BAY CITY CraneMobile has the strength and speed and dependability to make all lifts easier. This highly mobile, rubber-tired crane is available in a number of sizes with capacities up to 25 tons and a selection of carriers—designed and built by BAY CITY—to meet job requirements. The CraneMobile boasts a big power plant, a long wheel base, and heavy duty construction throughout. Even the longest boom can be raised all the way from the horizontal without the help of another crane. Write for CraneMobile Catalog, today.



Advantages of the BAY CITY CraneMobile:

- An independent worm boom hoist that raises and lowers boom or boom and load—only under power—through reversing clutches.
- Deep-section, pin-connected boom for long reach and easy changes. Boom hoisting cable does not need changing.
- Collapsible Hi-gantry 11'-8" in height.
- Controlled load lowering of maximum capacity loads at approximately one inch per second when using six parts of line.

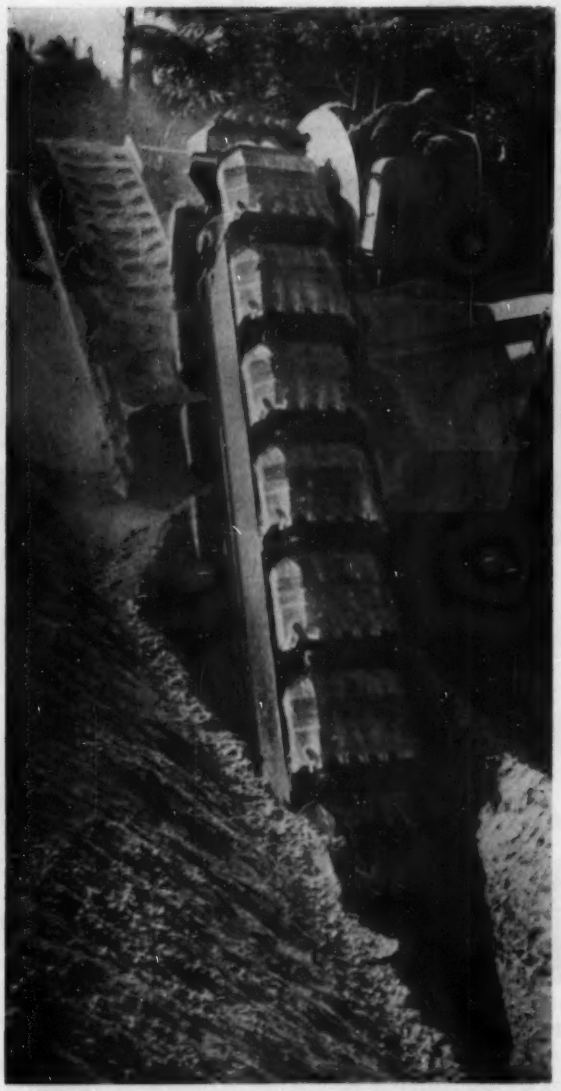


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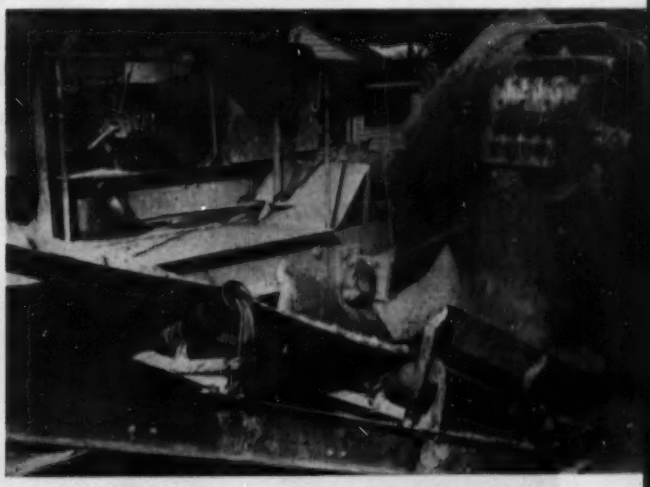
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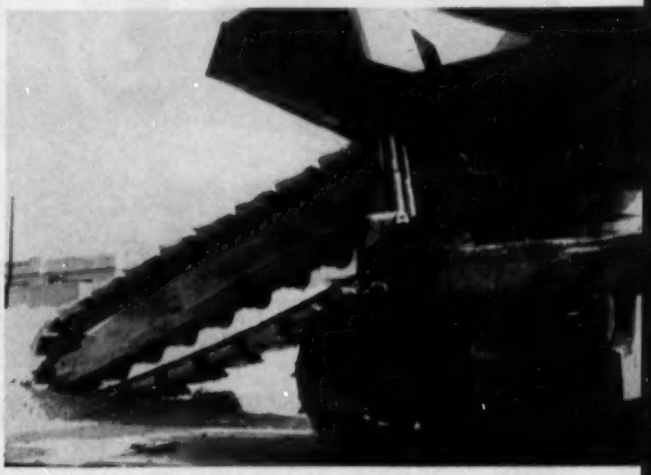
SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS



DIGGING BUCKETS carry special rock-cutting teeth. Wide, 50-ton rig can be transported by lowboy trailer, but needs a permit.



SIDE CONVEYOR receives spoil from bottom-dumping digging buckets and carries it forward to the transverse conveyor on front.



DITCHER'S LADDER incorporates parts removed from upper tractor unit's running gear. Digging buckets have replaced track shoes.

The ditching machine weighs 50 tons, 30 of which is carried by the left crawler. Yet it is easily controlled by one operator and one helper because of its automatic features. "Running the machine is so monotonous," Stewart admits somewhat ruefully, "that we have difficulty keeping an operator. After all, a man good enough to be responsible for that much machinery doesn't want to just sit there all day."

Ditcher Digs Drain

The unique ditcher is presently at work on a storm drain job of Troup Bros. Inc. in a Miami street. For the Florida State Road Dept., Troup has to dig a trench 12 ft wide and as deep as 17 ft through coral rock. At the bottom of this trench the actual drain is dug 7½ ft deeper and 8 ft wide. Then precast concrete slabs 12 in. thick are placed as a roof for the drain, and the trench backfilled above.

The ditcher's job is to outline the 12x17-ft trench. It does this by cutting a slot down each side, just within the net excavation line. Material excavated from the slot is dumped to the ground and then put back into place after the ditcher passes. When the outlining is complete, a backhoe will remove the material backfilled in the slots, the solid core between them, and the rock from the drain proper.

Reason for this procedure is that the ditcher eliminates any over-excavation. More importantly, according to E. K. Troup, "The hoe would spend too much time trying to cut straight and would burn up its frictions trying to hold the bucket against the sides of the trench."

As for ditcher progress on the current 28-in. by 17-ft slotting job, Troup and Stewart disagree. Yet they are both probably right. Troup says the machine nets only 50 ft of slot per hr, but he's talking about sections where the ditcher must skip over utilities buried in the street. Stewart claims 100 ft per hr when the machine has clear sailing.

"We Cut Labor Costs 50% with our SKIL Radial Saw"

Says Mr. V. K. Nelson, Home Builder
Speedway City, Indiana



Model 450 SKIL Radial Saw, available from 2 to 7½ HP. Depth of cut to 5⅛". 19" cut-off capacity on 1" stock, 33" rip capacity. Greater capacities at optional cost.

Savings in time and labor! These are the advantages that put builders and contractors "on record" in favor of SKIL Radial Saws!

SKIL does every job faster than any other radial saw. Exclusive "Retracto-Glide" Arm provides clear work area, reduces set-up time as much as 30% because cutting head retracts *all the way*. Controls are within easy reach from operating position. Fewer time-wasting adjustments. Sets up quickly and easily for bevel, miter, compound and other cuts.

See how a SKIL Radial Saw can simplify material handling, reduce costs and increase output for *you!* Call your distributor today!

Look At These Stand-Out SKIL Advantages!

- **Clear Work Table!** Plenty of layout room, no blind spots, no "ducking" under overarm!
- **Greater Support!** Exclusive wide spacing of 8 grease-sealed ball bearings in supporting head!
- **Easy Cut Changeover!** Any angle cut may be set up in one quick step!
- **Router-Shaper Attachment** for 3 times faster routing and shaping!

OVER ONE MILLION SKIL SAWS IN USE

Made only by SKIL Corporation
formerly SKILSAW, Inc.
5033 Elston Avenue, Chicago 30, Illinois
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Factory Branches in ALL Leading Cities

SKIL PORTABLE TOOLS

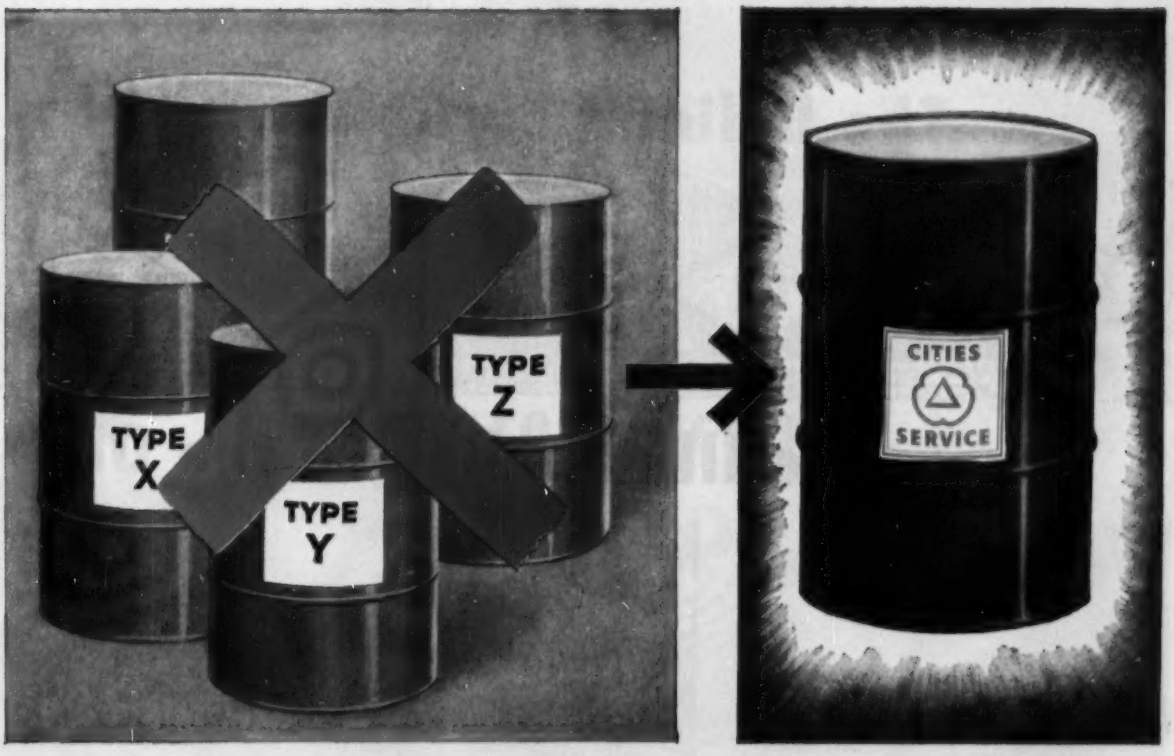
Now! An All-New
PORTABLE SKIL RADIAL SAW



SKIL Model 649 delivers 25% more power to blade than any other 1½ HP radial saw!

Lightweight, compact, goes directly to the job! Can be carried through doors for trim cutting after framing is completed. Peak power, plus 2⅛" depth of cut gives more value than any other radial saw in its class. Handles tough miters on 2 x 8's or larger!

See Your Distributor For Complete Information Or Call Your Nearby SKIL Factory Branch



NOW—ONE GREASE FOR ALL YOUR EQUIPMENT

New Multi-Purpose TROJAN H Grease!

Let Cities Service Multi-Purpose Trojan H Grease, the remarkable new lithium base lubricant, take on the job of practically all your present greases and do a better job than any special grease.

Used for all types of bearings, chassis lubrication, water pumps and conveyor systems, this one unmistakable "red" grease is ideal for everything from the smallest service truck to the largest shovel.

New Multi-Purpose Trojan H not only has greater stability than previous greases, it also pumps easier at low temperatures, flows easier, and has exceptional resistance to water, oxidation, and rust. Best of all, it lasts longer and tests show it takes *less* to do this superior job of lubrication. Result: You save time, confusion, and money!

For more information about this unusual multi-purpose grease, talk with your Cities Service representative. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

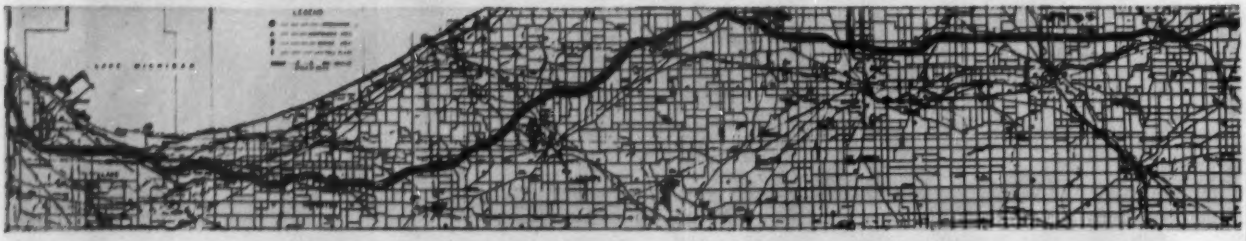
USE JUST ONE GREASE
and get all these benefits

- Simplified inventory
- No possibility of error in application
- Less grease consumption
- Easier dispensing
- Less lubrication time
- Better grease stability

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

The Indiana Turnpike...1955



from the Illinois line to the Ohio



used ALLIS-CHALMERS equipment



More and more contractors, on all types of construction jobs, are taking full advantage of Allis-Chalmers equipment to bring new efficiency and economy to their production schedules. See your Allis-Chalmers dealer now . . . for the facts about *advanced basic design* and how it can help *you* do more work at lower cost.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

equipment report



line...leading contractors



to move BIG YARDAGE...FAST

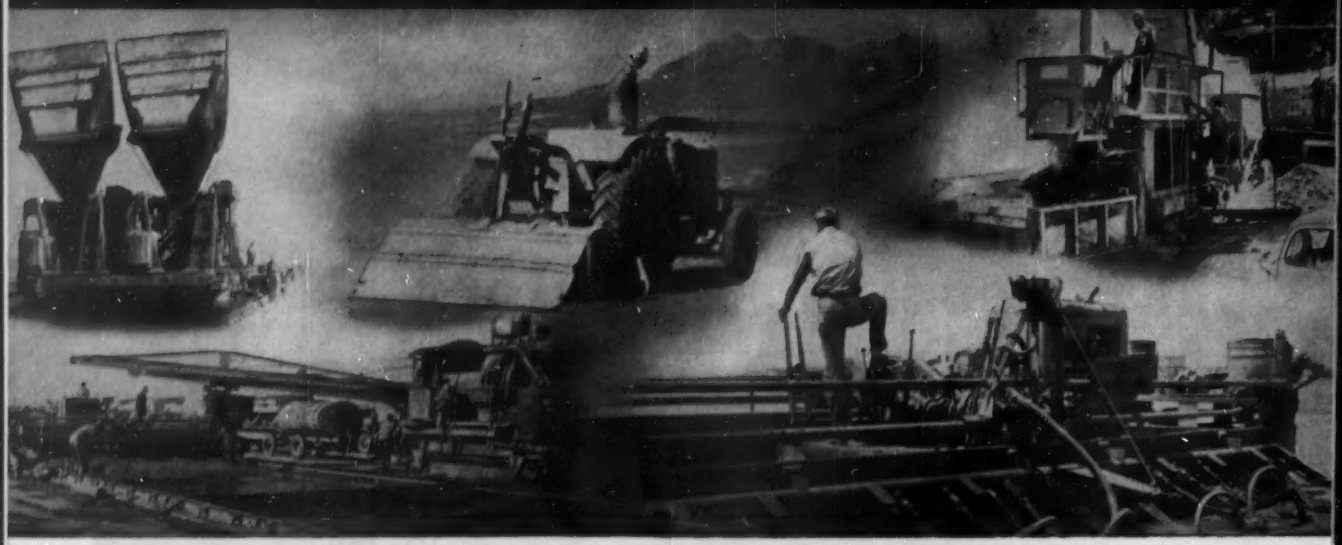




Contractors working on this great Indiana toll road used more than 200 Allis-Chalmers crawler tractors, motor scrapers and motor graders.

ALLIS-CHALMERS

PAVING...How to Get the Best Results



6. Preparations for Concrete Paving

By L. M. ARMS
Manager, Highways and Municipal Bureau
Portland Cement Association

CONCRETE PAVEMENT construction practices have undergone extensive changes in the last few years. Equipment has become more mechanized and efficient; vibration has assumed an important role in compaction of both bases and pavement.

The yardage of concrete pavement built has increased each year since the end of World War II. It has more than doubled during this period. Expressway, toll road, and primary highway construction now underway over the nation—and prospects for a long-range, national highway-building program — indicate a continuing increase in the annual volume of concrete pavement construction during the years ahead.

Construction of quality concrete pavement requires that a well-designed and controlled concrete mix be placed properly on a suitable, uniform foundation. Excavation, embankment construction, mix design, proportioning, and central mixing plants have been covered in previous articles in CM&E. This series of articles will be confined to subbase installation, batch hauling, mixing on the road, and placing, finishing, and curing the pavement.

Subbases

Progress in soil science and studies of pavement performance on various types of soil under differing climatic and traffic conditions have established criteria for subbases to insure satisfactory pavement performance.

Many native soils, when properly compacted will provide suitable subgrades on which to place concrete pavement. Others will contribute to poor pavement performance unless subbases are constructed between the native soil and the pavement. Subbases are necessary if the subgrade is subject to:

- Frost action.
- Swell and shrinkage in high-volume-change soils.
- Pumping of fine-grain soils.

Subbases seldom can be justified economically for the sole purpose of increasing the bearing capacity of native subgrade soils. Unless they are required to eliminate one or more of the above potential causes of trouble, additional load-carrying capacity can be secured more economically by increasing the pavement thickness, rather than by construction of subbases.

But, if the use of a subbase is indicated, the design should take account of the increased load-carrying capacity it will afford. Whenever practical, a small test section of subbase should be constructed to the density specified for the pavement subbase and its load-carrying capacity determined by plate-bearing tests.

If adequate compaction is obtained at proper moisture content, only nominal thicknesses of granular subbases (4 to 6 in.) are necessary to control pumping and to eliminate the effects of high-volume-change soils. If silts or fine sands, which are subject to frost heave are present, they should be removed and replaced with non-frost-heaving material to at least one-half the average depth of frost penetration. If the subgrade soil differs considerably from the non-frost-heaving material used in backfilling, the replacement should be feathered out to prevent an abrupt change in subgrade support.

Granular materials with a wide range of gradation have been used successfully in subbases to prevent



USERS EVERYWHERE praise the RUGGED EFFICIENCY of Whiteman Vibrators

CHICAGO REPORTS:

"We are more than satisfied with our Whiteman Vibrator. Does more thorough job than we thought possible."

RICHMOND SAYS:

"Your machine sure has got everything it takes. It's doing a fine job and hasn't given us a bit of trouble."

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"You'll be happy to know that we consider this the best vibrator we've ever owned. It's got lots of extra power and sure is built to stand up."

LOS ANGELES REPORTS:

"We figured Whiteman would come out with something good, but this machine tops them all. Congratulations!"

From Coast to Coast come enthusiastic reports of the superior performance of Whiteman Vibrators. Contractors have found everything they expected in these machines, engineered and built by Whiteman, the leader in concrete equipment . . . rugged stamina, highest efficiency and complete dependability. A model for every job requirement. Before you buy any vibrator, be sure to see the great Whiteman line.

MODEL GW →
with wheelbarrow base. For heavy duty work. Reliable 6 HP Wisconsin engine. 9,000 VPM.



MODEL SW →
with swivel base. For use on average jobs. 2½ HP Briggs & Stratton engine. 4,000 VPM.



MODEL EW →
features new, highly efficient Whiteman electric motor with centrifugal blower cooling system. 9,000 VPM.





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SCREEDING MACHINES

THE LEADER IN CONCRETE EQUIPMENT



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Please send prices, literature and name of distributor for ☐ Vibrators, ☐ Screeding Machines, ☐ Power Buggies, ☐ Floating-Finishing Machines, ☐ Truck Mixers

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MANITOWOC faster cycle speed moves more dirt



Leveling ground at a Staten Island borrow pit recently, contractor Peter Juzefyk, Elizabeth, N. J. excavated approximately 100,000 yards of gravel fill to complete the job. Juzefyk averaged 2 minutes – 50 seconds time to load 16-yd. haul units with his Manitowoc Model 2000 1¼-yd. shovel. Total loading time often included a move to place the shovel in a better digging position! As much as 2100 yards was removed from the site in one 9 hour shift.

Why MANITOWOC 2000 does a faster job

FULL USE OF POWER speeds digging. Only 13 gears and pinions make more power available at all times to add horsepower at the dipper (only working gears turn). SMOOTH, DISC-TYPE CLUTCHES speed operation — make control extremely precise. As easily adjustable as automobile-type clutches. SIMPLICITY OF DESIGN and smooth operation greatly add to cycle speed. Sliding pinion arrangement uses just one set of clutches to travel, swing and boom hoist. FAST TRAVEL with extra push for grades up to 30%. Positive steering utilizes either crawler, forward or back. Rugged, simple crawler base has balanced stability needed for digging on uneven terrain. EASILY CONVERTIBLE in the field to crane, dragline and trench hoe operation — whatever front end the job demands.

MANITOWOC
SHOVELS 1-5½ YD. CRANES 20-100 TON
Speedcranes

On your next bid let Manitowoc speed and power help cinch the deal. Contact your helpful Manitowoc distributor for the full, profitable story.



END-DUMP TRUCK feeds subbase material to self-powered Blaw-Knox spreader which lays material to a width of 14 ft and a depth of 11 in. After compaction depth is 8 in.

frost damage, warping, and pumping. Briefly stated, no pumping will occur on fairly well-graded granular soils having more than 55% retained on a 200 mesh sieve and having a plastic index of 6 or less for the portion passing the No. 40 sieve. Materials meeting these specifications pass absolute minimum requirements for a subbase.

Coarser materials should be used when economically available and when frost is expected to penetrate into the subbase. Experience may dictate that on pavements subject to very heavy traffic, the amount of material passing the 200 mesh sieve should be as little as 15%.

A wide range of materials can be used in subbases. Sand, gravel, crushed stone, and slag all have given satisfactory service. Most projects will be within fairly short hauling distance of an adequate supply of such suitable subbase material. In some instances, cost studies may be necessary to determine which of several choices will give the most economical subbase.

Subbase materials often are classified as either "open-graded" or "dense-graded." There is no exact line of demarcation between the two types. But, in general, material of which more than about 10% is retained on the 200 mesh will have such a low permeability as to be considered dense-graded.

When dense-graded materials are used, the subbase should be constructed about 2 ft wider than the pavement. No special provision for draining such subbases need be made because, when properly compacted, they are practically impervious.

When open-graded materials are used, some positive means of preventing the accumulation of water in the subbase should be provided. This can be done by placing these materials the full width of the grade or, if a trenched-in section is used, by placing blind or pipe drains at necessary intervals.

Specifications for subbase materials vary widely. Many states set gradation limits for various materials, with differing maximum size of aggregate, as shown in this table of Pennsylvania gradations.

(Continued on page 112)

GRADATIONS

Percentage Passing	A Min	A Max	B Min	B Max	C Min	C Max	D Min	D Max
3 in. sieve	100	—						
2½ in. "			100	—				
1½ in. "	40	90			100	—		
¾ in. "			40	90			100	—
No. 4 "					40	90		
No. 10 "	15	50	15	70			40	100
No. 40 "					6	55	10	55
No. 200 "	0	15	0	15	0	15	0	15

LAYKOLD Weathercoat



–a "permanent poncho" for exposed insulation

If you have "hot" or "cold" tanks, towers, vessels or piping exposed to the weather, you know the problem. Insulation must be kept *dry* to be effective. Weathercoat is the answer.

High-efficiency insulation insurance

Laykold Weathercoat is the best "raincoat" your units could have because it seals out not only water but also water vapor. In addition, Weathercoat stays "alive" through season after season.

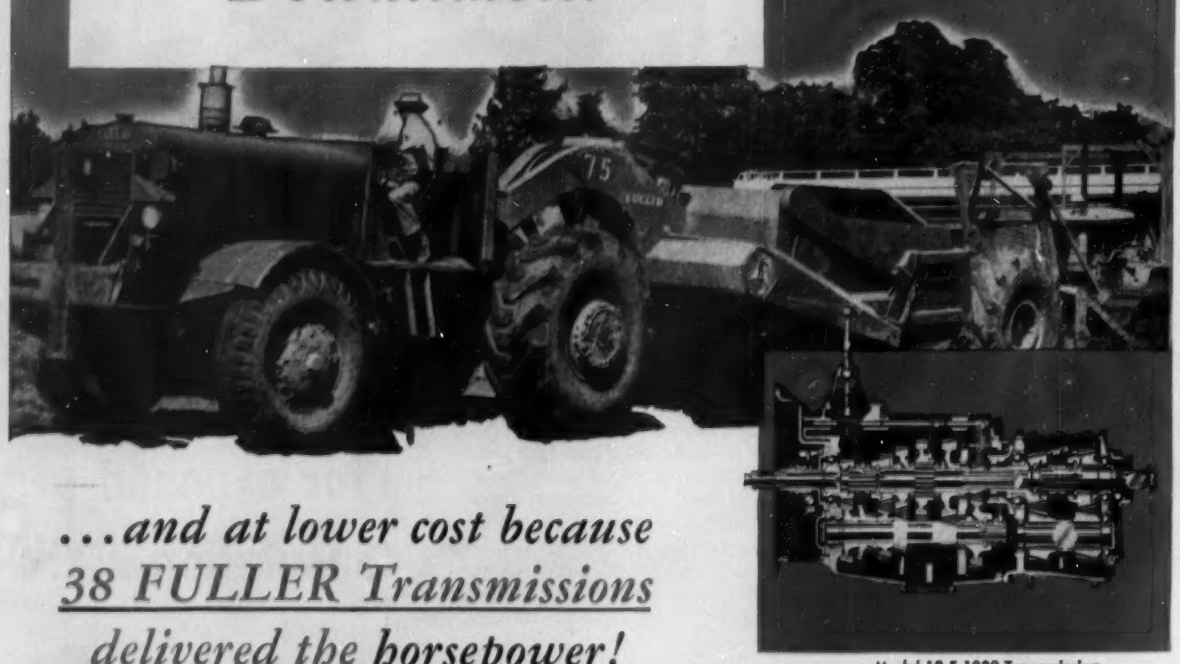
Write for full details.

AMERICAN Bitumuls & Asphalt COMPANY

200 BUSH STREET
SAN FRANCISCO 20, CALIFORNIA

This job was done

Quicker, with Less Downtime...



Model 10-F-1220 Transmission

...and at lower cost because 38 FULLER Transmissions delivered the horsepower!

On the three sections of the Ohio Turnpike totaling 12.1 miles near North Royalton, Ohio, for example, the Cook Construction Company of Jackson, Mississippi, used 8 of these 14TDT Euclid Motor Scrapers of 18 yard capacity, equipped with 10-speed Fuller 10-F-1220 Transmissions to speed up the earthmoving. The scrapers are powered by NHS 600 Cummins 275 hp engines.

Cook Construction also used 30 Model 4FDT Euclid Bottom Dumps with Fuller 5-A-920 Transmissions, powered by Cummins NH 200 hp engines, in moving the 6,000,000 yards involved.

Says P. E. Maxsween, Equipment Superintendent: "Whenever I have a choice I *always* specify Fuller Transmissions because I like the way they stand up on the job." Maxsween also likes Fuller Transmissions because they get the job done faster, more efficiently, at less cost and with less downtime.

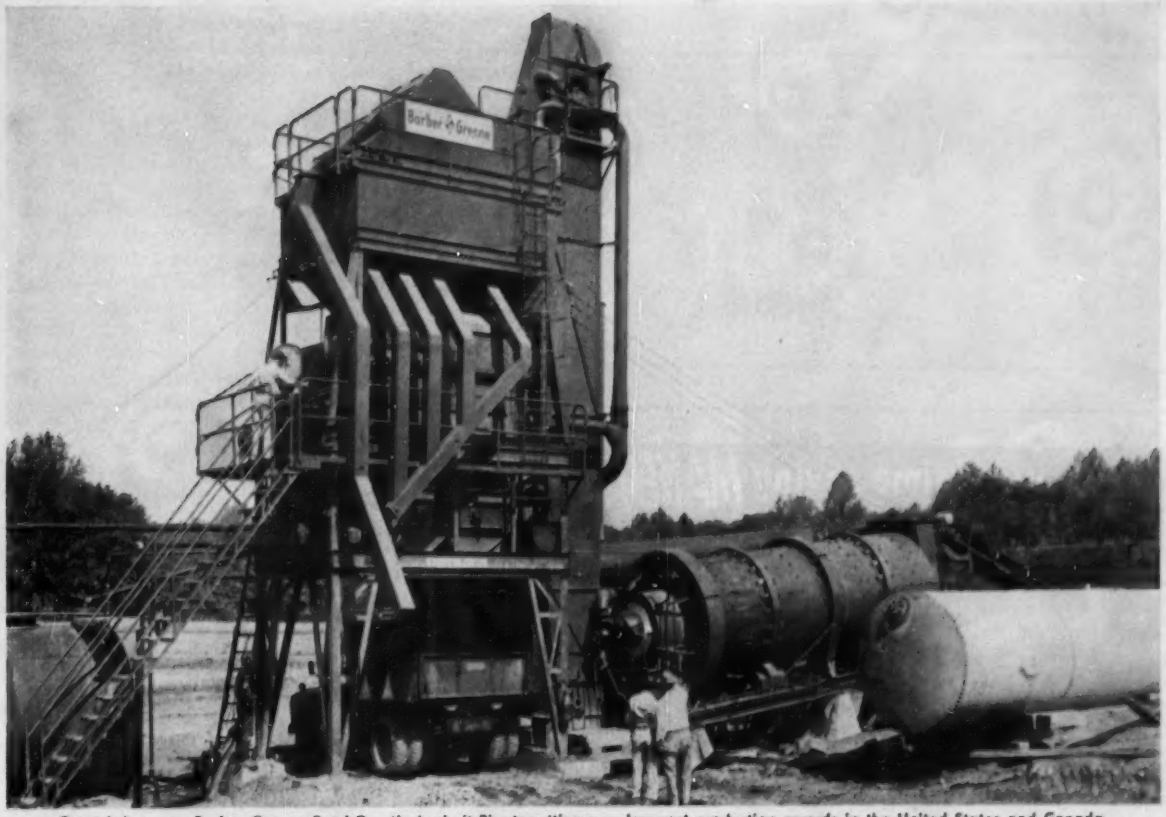
Cook Construction Company, subcontractor to T. L. James Company of Ruston, Louisiana, on the Ohio Turnpike job, has moved the Fuller Transmission equipped earthmovers to a section of the Kansas Turnpike near Wichita, for which they are prime contractors.

In Kansas, as in Ohio or elsewhere, Fuller Transmissions are putting horsepower to work, efficiently . . . profitably.

Fuller TRANSMISSIONS

FULLER MANUFACTURING COMPANY (Transmission Division), KALAMAZOO, MICHIGAN

Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla.



One of the many Barber-Greene BatchOmatic Asphalt Plants setting new low cost production records in the United States and Canada.

Now . . . two, four and six thousand pound Barber-Greene BatchOmatic plants

Less than a year ago Barber-Greene introduced the revolutionary BatchOmatic—the first plant ever designed from its original conception for completely automatic operation. In that short time the success of this batch plant has been established all over the United States and Canada. Owners and operators everywhere report that the automatic operation has reduced their costs, increased production and expanded their market. Inspectors find that the BatchOmatic consistently produces mixes to specification with automatic accuracy.

Now the Barber-Greene BatchOmatic is available in three sizes: two, four and six thousand pounds.

Now you can choose the capacity that best meets your needs and get the money-making design features that lead the field . . .

Simultaneous weighing of all sizes of aggregate . . . to eliminate the human element in achieving accuracy and maximum capacity.

Instant change-over from automatic to manual operation . . . to provide mixes for the drive-in trade . . . instantly reset to preset repetitive cycle operation.

New Dyna-Mix pugmill . . . to give more thorough coating in less time than any other pugmill.

Instant, positive inspection of aggregate gradation and weight.

56-T-W8

Write for your copy of "Principles of the BatchOmatic"—clearly illustrated



Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

Percentage Passing	Gravel Subbase Min	Gravel Subbase Max	Crushed Gravel or Crushed Stone Subbase Min	Crushed Gravel or Crushed Stone Subbase Max
1 in. sieve	100	—	100	—
¾ in. "	80	100		
½ in. "	65	100	60	90
No. 4 "	40	60	40	60
No. 8 "	25	50	25	50
No. 16 "			20	40
No. 40 "	18	30		
No. 200 "	5	10	5	15

The soil fraction (material passing the No. 40 sieve) should have a liquid limit of not more than 30 and a plastic limit of not more than 6.

Illinois specifications limit the maximum size of gravel or crushed stone to 1 in. and specify the following limits for subbase materials.

The gravel subbase material passing the No. 40 sieve should have a plastic index between 2 and 9 and a liquid limit of 35.

Both open and dense-graded materials could meet Pennsylvania specifications. But most of the crushed gravel and crushed stone conforming to the Illinois specifications would be dense-graded.

Before any subbase material is placed, the subgrade should be at the proper elevation and compacted to the specified uniform density. Subbase material usually is hauled to the subgrade in trucks. The material can be end-dumped from trucks and spread by graders or distributed on the subgrade by spreaders. Spreaders may be self-propelled, pulled by the truck hauling the material, or pushed by a tractor.

Whatever method of spreading is used, sufficient material should be deposited so that the surface will be slightly above the required final elevation after compaction. This usually requires a spread about 15% to 30% deeper than the estimated compacted thickness, depending upon the type of material. Some materials, such as open-graded mixes composed essentially of sand, will compact very little. The purpose of finishing the subbase slightly high is to insure sufficient subbase material at all locations after fine-grading operations are completed.

Many specifications outline the type and size of equipment to be used in securing the desired density of the subbase material. Others specify only the desired density and leave it to the contractor to determine the best method of obtaining it.

When the required density is specified, it usually is expressed as a percentage of the density obtained in the laboratory by the Standard Method of Test of the American Association of State Highway Officials. This test determines the water content at which maximum density of any given material is obtained when a 5-in. depth of material is compacted in three layers, each layer of which receives 25 blows of a 5½-lb hammer dropping 12 in.

(Continued on page 116)

If you want time saving MANEUVERABILITY ...you want a MILLER!



Miller "87" 10 ton Tandem axle $1,635.00* F.O.B. Milwaukee
Any optional equipment extra
*Plus Freight and 8% Federal Tax

2 minute loading cuts time between jobs!

You can spot equipment with the ease of a hipless snake when you're backing a MILLER trailer. One man (a dump truck operator) can tilt, simply drive the equipment onto the broad oak decked platform . . . be on his way in less than two minutes. You cut between-job time losses on men and machines . . . boost productive time on every job! Many contractors also find MILLER Tilt-Top's one man equipment shuttling can often save duplicating expensive equipment on different job locations.

And Miller trailers are available in a variety of single or tandem axle Tilt-Tops, or low beds, to carry dozers, shovels, trenchers, rollers and other heavy equipment. All are built for the "long haul" — with MILLER'S massive "EDG-SUPPORT" frames, Timken roller axle bearings and 2" oak deck platforms.

Best of all . . . you pay no premium for quality — no comparable trailer undersells a MILLER! See these production boosters at your MILLER distributor today — and compare!



Miller Model "D" 4 ton Low Bed $595.00* F.O.B. Milwaukee
Any optional equipment extra
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✓ built best
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Miller Tilt-Top Trailer Co.
457 S. 92nd Street, Milwaukee, Wis.



Pumping Station, Madison, Wisconsin — Contractor: Garrett Const. Co., Madison

A Moretrench Wellpoint System in two easy stages took the water down to 2' below subgrade — out of sight — out of trouble.

Dry material was rapidly and economically excavated. Sloped banks required no sheeting. Progress at a profit followed.

Our illustrated catalog shows you how different types of wet jobs are pumped. Send for your copy today.

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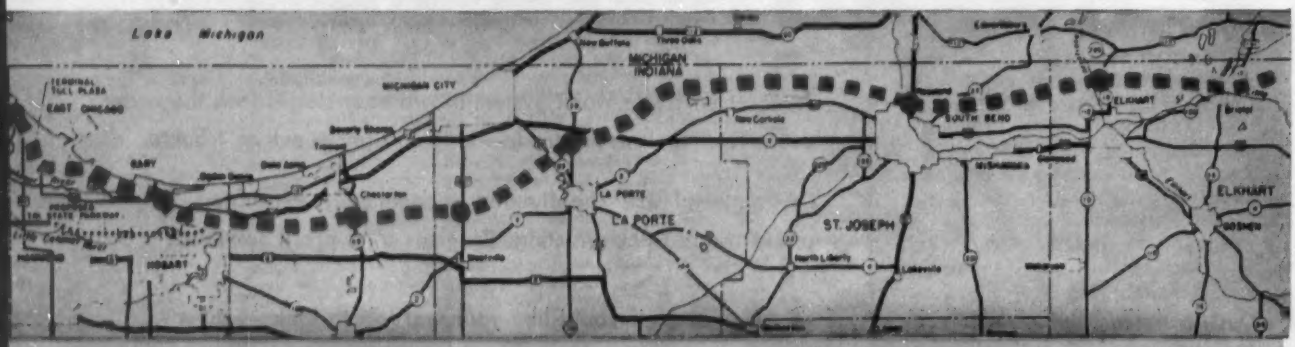
Indiana Toll Road Contractors use STANDARD *Lubricants and Fuels*

Prime contractors and sub contractors on the project choose STANDARD. Reason: 1 top quality 2 service

The Indiana Toll Road is the biggest construction project ever undertaken in the State of Indiana. All parts of the job are going at a high production rate. To maintain such a record, contractors must get top performance from equipment. STANOLUBE Motor Oils, STANDARD Diesel Fuels and STANDARD Gasolines help them get this kind of performance—with plenty to spare—from all types of equipment, under all operating conditions, in any weather.

To keep on schedule, supplies of lubricants and fuels have to be where needed at any hour, day and night. Standard Oil maintains stocks at the job site for every one of the contractors served. Equipment never waits for fuel or lubricants. Time down for maintenance is cut to minimum.

This is big construction. Small wonder that on this project from borrow pit and fill, from pile driver to batching plant, construction equipment uses STANDARD lubricants and fuels. Big job or small, let Standard be your supplier. In any of the 15 Midwest and Rocky Mountain states, Standard Oil automotive lubrication specialists are nearby and ready to help you. Call them or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.



Indiana Toll Road traverses state from Hammond, Indiana to junction with Ohio Toll Road, a total of 153.3 miles of four lane highway. Completion date: Fall, 1956.

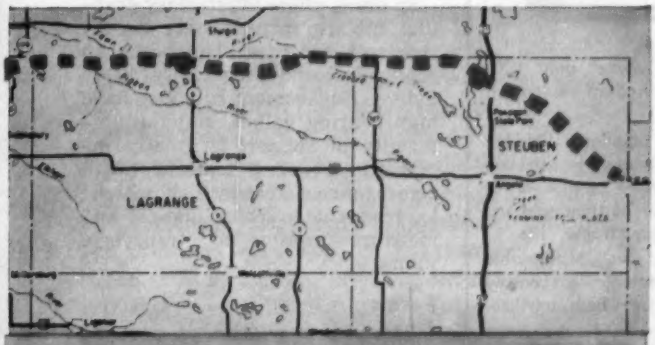


Rieth-Riley Construction Co., a prime contractor, cuts time out for lubrication maintenance by using lube truck; services construction equipment right at the job. Rieth-Riley has contract for building 7.4 miles of highway in St. Joseph and La Porte Counties; sets fast pace for equipment, uses Standard Oil Products.

Allis Chalmers HD 21 "push-loading" a Euclid scraper in borrow pit on Union Building & Construction Corp., job. Union is building 13.1 miles of Toll Road in Steuben and La Grange Counties and four miles in Lake County. They are one of the prime contractors on the project served by Standard Oil.



Equipment Superintendent, Lewis A. "Shorty" Martin (right), and Standard automotive lubrication specialist O. H. "Grit" Collier discuss parts maintenance at Western Contracting Corporation field shop. Field technical service such as this is old stuff to Grit Collier. He has been doing such work for 10 of his 22 years at Standard Oil. Grit is a graduate of the Standard Oil Sales Engineering School. Customers find this experience and training pay off *for them.*





Quick Facts About

STANOLUBE Motor Oils

1. STANOLUBE Heavy Duty Motor Oils are refined from high quality base stock.
2. Additives exclusive with STANOLUBE Heavy Duty Motor Oils retard oxidation, reduce formation of piston and ring belt deposits.
3. These additives in STANOLUBE Motor Oils prevent fuel from forming varnish and sludge.

STANDARD

STANDARD OIL COMPANY
(Indiana)

Compare

these extra LaCrosse values for yourself!



Quality Points	LaCrosse 10-ton tilt	Competitive 10-ton tilt
Drawbar channel	10"	7"
Main beams	8" channel	3/8" formed plate
Wing members	4" channel	1/4" formed plate
Side members	8" channel	2 1/2" x 2" x 3/16" angle
Front stringer	8" channel	6" channel
Rear stringer	6" channel	7" box sec. 3/16" plate
Deck width	96"	92 1/2"
Deck length	17'	14' 5 3/4"
Tire size	10.00 x 15" 14-ply	8.25 x 15" 14-ply
Wide base rims	Yes	No
Brakes	12 1/4" x 6" (Air or Vac.)	13" x 3" (Electric)
Hydraulic "cushion tilt"	Yes	No
Towing lunette	Adjustable	Stationary
Lights	Standard	None
Weight	4300 lbs.	2800 lbs.

If you could see a LaCrosse Model TSA2-10 trailer alongside several 10-ton capacity single-axle tilt-trailers, there would be *little question* as to which unit you would choose. But since you seldom have a chance to judge competitive trailers *side-by-side*, we felt this typical COMPARISON CHART would be helpful in appraising the *extra* performance features you get with LaCrosse Tilt Trailers.

As you can see in the above chart, the LaCrosse TSA2-10 is built *far more rugged* than its "10-ton-rated" competitor. The TSA2-10 also has a wider, longer deck . . . *bigger tires* . . . bigger, more powerful brakes . . . plus a hydraulic tilt mechanism that "*cushions*" *shock loads*. Adjustable towing lunette and ICC-approved lights are standard equipment.

Consider, too, these additional "hidden benefits" of LaCrosse *quality-controlled production*: Special frame positioners for stronger welds . . . shot blasting and undercoating for longer trailer life . . . custom-built axles, plus replaceable brake spiders for greater axle economy . . . fast parts service anywhere, anytime.

The superior performance of LaCrosse tilt decks and low-bed trailers, up to 75-ton capacity, has been pre-proved by *millions of miles* of owner use. Why be satisfied with anything else for your hauling requirements? Write for details. LaCrosse Trailer Corp., LaCrosse, Wis.

LC-36

91 YRS. metal fabricating experience

LaCROSSE

VALUE LEADER IN LOW-BED TRAILERS

PAVING . . .

Continued from page 112

Most specifications require that not less than 95% of this standard density be obtained in the field; some require 100%. These laboratory tests indicate the proper moisture content required to secure adequate density.

Dense-graded materials are readily compacted with conventional equipment such as sheepsfoot, flat-wheel, or pneumatic-tired rollers. Subbases of the usual thickness (4 to 6 in.) can be compacted to the required density in one layer. After spreading a layer of material, an amount of water sufficient to insure the desired compaction should be added and uniformly mixed in a manner to prevent segregation.

The use of grid rollers and vibratory methods to secure proper compaction of open-graded materials is growing in popularity. These types of equipment often will compact granular materials to densities that cannot be obtained by conventional methods.

Requirements for compacting equipment vary widely from state to state. For example, Illinois specifications for sheepsfoot rollers call for a minimum pressure of 100 psi on the tamping face area, but Missouri specifications require 200 psi. Both specifications require a minimum weight of 90 lb per in. of roller width. The specifications of these states for pneumatic-tired rollers are nearly the same—200 and 225 lb per in. of tire width.

In areas where satisfactory granular subbase materials are expensive, soil-cement subbases offer an economical and satisfactory alternative. Soil-cement subbases have high bearing values, and the uniformity of support is greatly increased. Treating materials with cement forms a base which is highly resistant to consolidation and moisture erosion at transverse joints.

Forms

The riding quality of concrete pavement depends to a large extent upon the quality of support which the forms give to finishing equipment. Good form alignment does not by itself insure a good riding surface, but a good surface cannot be obtained with bent or inadequately supported forms.

With the exception of the northwest portion of the country, steel forms are used for all paving except for sharp curves where flexible forms are necessary.

(Continued on page 118)

In 11 years, 7½ million tons were hauled—at less than ½¢ per ton!



A large Southern cement company decided in 1942 to install a conveyor belt system to carry Portland cement rock (90 lbs. cu. ft.). This material had previously been carried by trucks over a 2¼ mile road at a cost of over 8¢ a ton. After 5 years of operation, the belt system had paid for itself, besides keeping the plant running without worrying about gas and tires for trucks throughout the war. Estimated cost per ton was less than ½¢!

The United States Rubber Company belts were used as follows:

- **Primary Crusher Belt (U. S. Matchless®)**
- **Secondary Crusher Belt (U. S. Giant®)**
- **Seven other "U. S." Belts, ranging from 929 feet to 2399 feet, from Surge Bin to plant**

These belts ran an average of 40 hours to 84 hours a week, year after year.

Belts nos. 1 and 2 from Surge Bin were removed after 8 years. The other Surge Bin belts were replaced after 11 years and 1 month's service, and over 3000 feet sold to various sand and brick plants at $1.50 per foot. These belts were replaced by new "U. S." belts.

"U. S." Three-Way Engineering is responsible for such a remarkable performance. "U. S." belt engineers worked closely with the designers of the conveyor equipment and the engineers of the cement company. The result, as always, is the most efficient and economical belt for the job. That is why cost-minded plant operators call on "U. S." engineering and conveyor belt experience to solve any materials-handling problem. U. S. Conveyor Belting is obtainable through any of the 27 "U. S." District Sales Offices. Or write us at Rockefeller Center, New York 20, N. Y.

US RUBBER

Mechanical Goods Division

United States Rubber



"THIS LUBRICANT DOUBLES THE LIFE OF GEARS"

—says TRINITY ALPS LUMBER CO.
Hayfork, California

"Our trucks have a forty mile county road logging haul over adverse grades, each truck making two complete round trips each working day. Our shop foreman in charge of maintenance, reports that with the use of LUBRIPLATE Lubricants there has been a minimum of truck down time and replacements of bearings and gears. The double reduction gears with LUBRIPLATE APG-140 has shown a saving of fifty per cent over previous operations."

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE

LUBRIPLATE LUBRICATION MAKES CARS AND TRUCKS RUN BETTER AND LAST LONGER



LUBRIPLATE H.D.S. MOTOR OIL . . . THE OIL THAT NEEDS NO ADDITIVES

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.



PAVING... Continued from page 116



FORM GRADE is cut by Cleveland form grader at about 600 ft per hr. A bar connected to the blade rides on a stringline which indicates proper grade and alignment.

Steel forms are made in 10-ft lengths and are held in position by three wedged pins and end locks. Many highway specifications require the width of the form base to be equal to the height. Some simply specify that the base shall not be less than 8 in. wide. This is adequate for 9-in. edge depth pavement, but for thicker slabs (such as airport runways, taxiways, and aprons) the base width should be at least 8/10 of the height.

The design of the forms and the thickness of metal used in their construction should be sufficient to give them the required rigidity to resist the load and thrust of the finishing equipment without excessive deflection.

All standard forms have three pin holes in which pins are wedged to hold the form firmly in position. The pockets which hold the pins should be of the same gage metal as the form itself and should be riveted or welded to the face and base of the form. These diagonal braces strengthen the form and help prevent bending and twisting under the impact of finishing equipment.

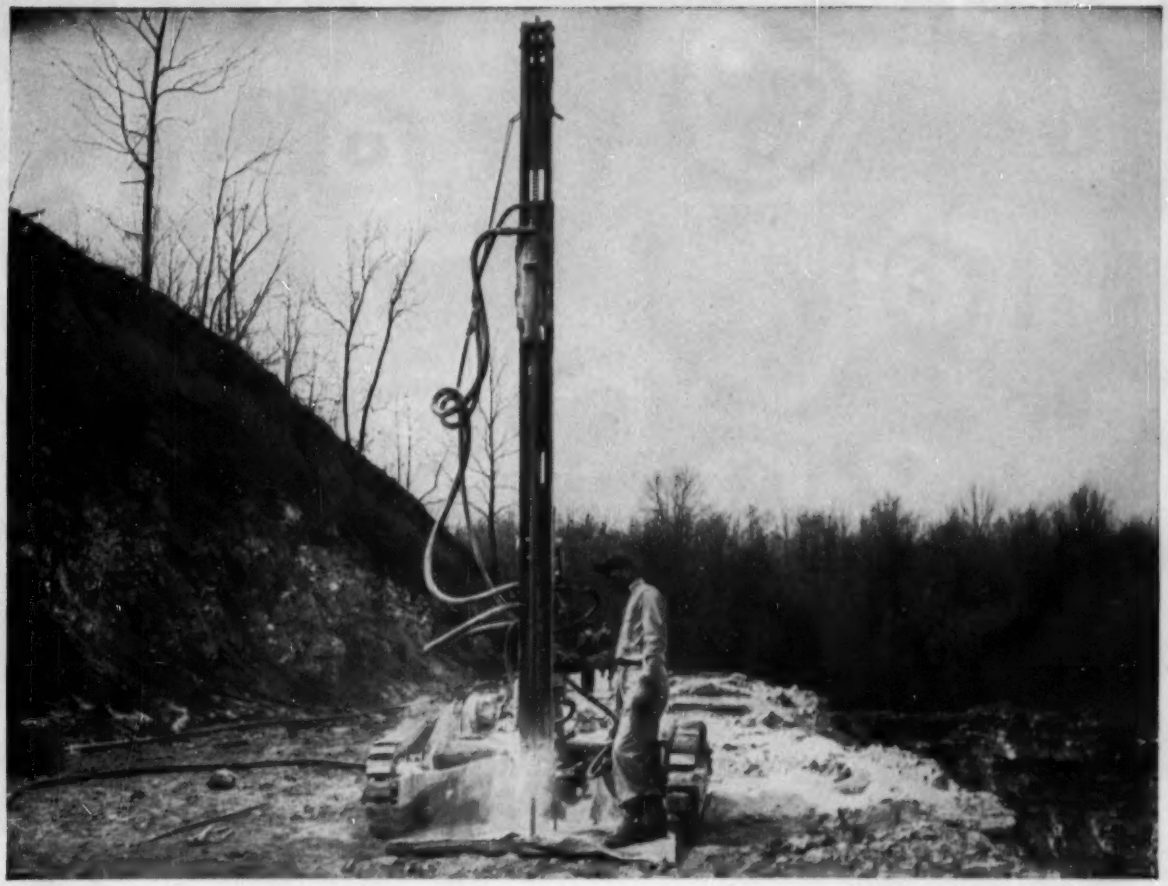
Pins of the proper length should be inserted in each hole and driven well into the subgrade to hold the form in position. Length of the pins depends upon height of the forms and type of subbase or subgrade. They should be at least 18 in. long for 8 or 9-in. forms and should increase to 30 in. for forms 12 in. high. They should be longer for the more plastic and lower density subgrades. Well-compacted subbases of high density permit the use of shorter pins by giving good lateral support to the portion of the pin below the forms.

Forms should have sliding lock plates at one end to fit under the flanges of adjacent forms and insure positive alignment at the joints. They should slide easily into locking position. This will help prevent their being battered out of shape during installation and removal. And easy operation will help to insure that all locks are in position each time the forms are set. Failure to lock each joint may result in stop-offs during operation of the finishing equipment and irregular surface alignment.

Standard steel forms are designed so that they can be used on curves with radii as short as 150 ft. Shorter radii require some type of flexible form, usually sheet metal or 1-in. wood. These do not have to be of the heavy construction of standard forms because mechanical finishing equipment cannot negotiate sharp curves. Hand-finishing methods almost always will be used under these conditions. Flexible metal or wood forms are secured in position by stakes driven at frequent intervals to hold them in proper alignment.

In the northwest, the use of wood forms is common. The specifications of the Washington State Highway Dept., for example, permit the use of either metal or wood forms. If wood forms are used, Washington specifications require that they shall have a thickness of at least 3½ in. and a width (depth of form) not less than the pavement thickness. Each form must be at least 16 ft. long. The strips must be held together by wood scabs no smaller than 1x6x12 in. nailed across each joint. They must be supported on concrete footings or

(Continued on page 122)



It's new! Gardner-Denver "Air Trac"® Drill
a self-propelled drilling rig with heavy-duty drill

The Economical Answer to Deep Hole Percussion Drilling in Pits, Quarries and Surface Rock Cuts

Spots accurate holes . . . drills fast . . . on steep hillsides or rough or rocky ground.

Air Trac crawlers have full-traction shoes — each track self-propelled through double-chain drive by its own Gardner-Denver high-torque, five-cylinder radial air motor.

Self-equalizing, self-stabilizing column arm supports Gardner-Denver chain feed drilling mast. Rugged chain feed powered by a high-torque, five-cylinder radial air motor.

Two Air Trac models — one equipped with powerful DH123 (4½") drill — one with the smaller DH99 (4") drill. Furnished with high-quality Gardner-Denver Ring Seal Shanks and Gardner-Denver Sectional Drill Rod equipment for efficient, low-cost deep hole drilling. Send for full specifications.

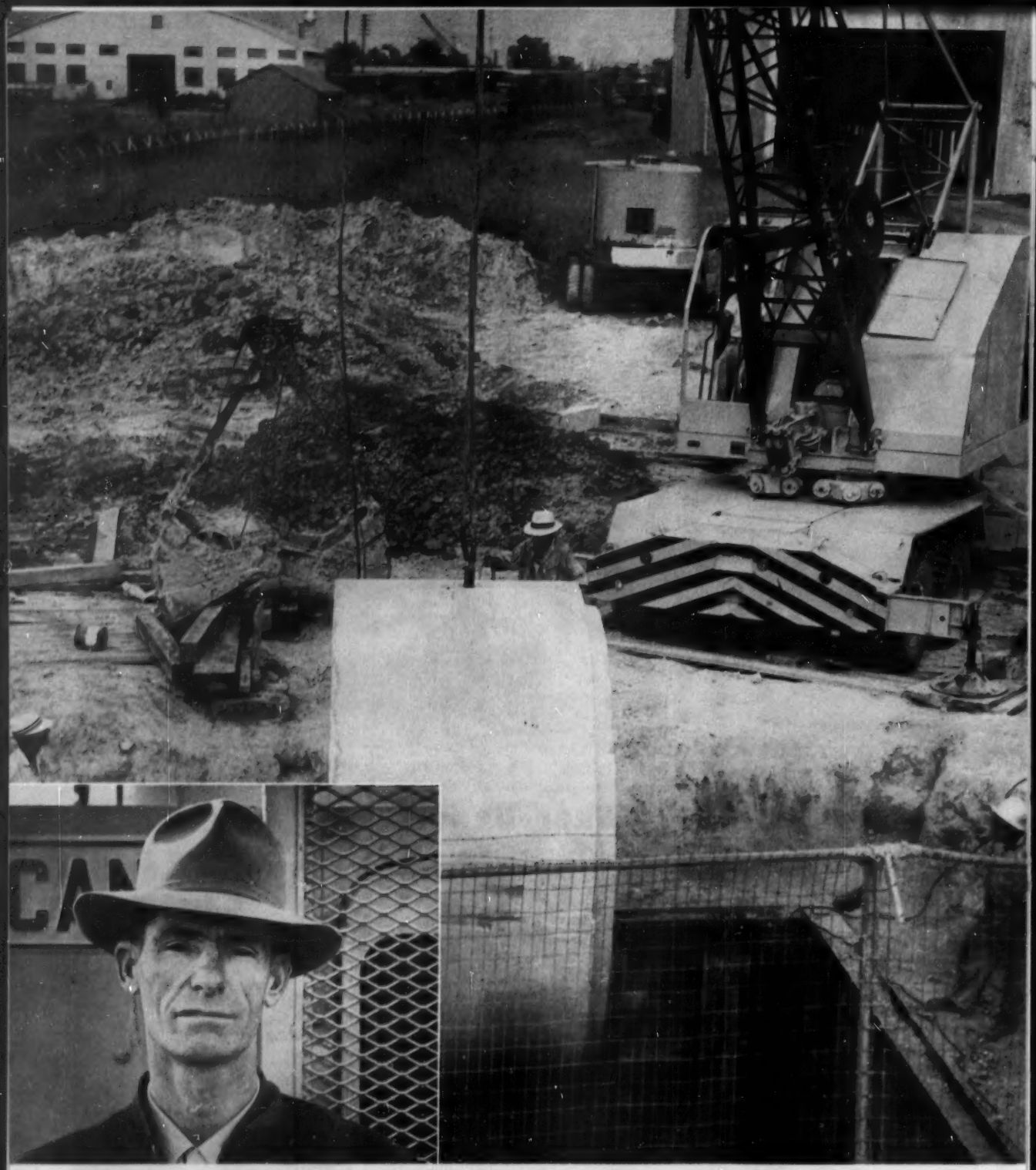


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"AIR TRAC"



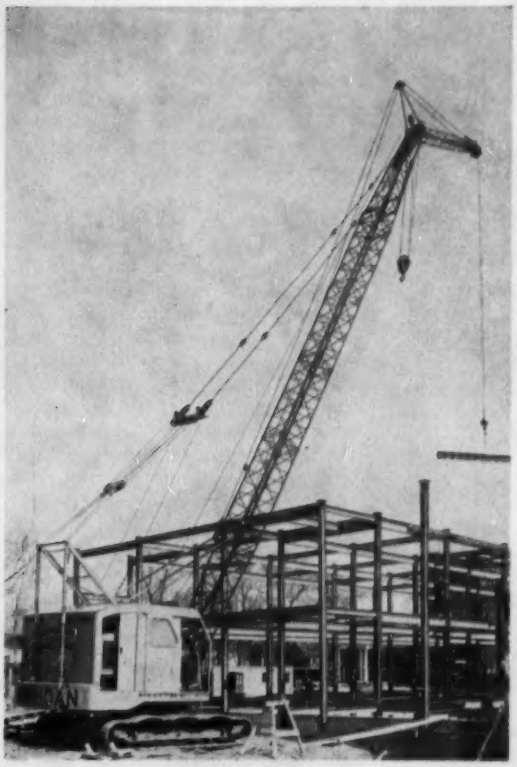
AMERICAN SETS 8-TON PIPE SECTIONS WITH PIN-POINT ACCURACY

On a storm drain extension project in the City of Memphis, an American 300 Series Truck Crane turned in a versatile, efficient performance under difficult conditions. Operated as both a clamshell and a crane the American dug the trenches and helped set huge 108-inch diameter concrete pipe sections weighing 16,650 pounds. High tension wires, railroad tracks, and close quarters in the city were problems easily overcome by the American Truck Crane's mobility and by its sure-footed stability. W. R. Riley, Construction Superintendent for M & W Construction Co., Tupelo, Miss., says: "American's power control boom lowering helped place those big pipe sections fast and with pin-point precision. With American handling the load, the boys down in the pits knew the job would be handled safely, too. We consider the American our work-horse—a real producer."

(Advertisement)

FAST CLAMSHELL WORK by the American 300 Series Truck Crane keeps work moving without delays on the City of Memphis storm drain extension project. "The American is really engineered for top capacity," says Mr. Riley, Construction Superintendent. "Everything's handy for easy maintenance." Double hook rollers on American's machinery deck provide a free rolling action for smooth swings. Standard-size anti-friction bearings used in all high speed shafts, gears and assemblies give fast, smooth operation and reduce wear and maintenance problems. Clutches are designed to give perfect feel-of-the-load at all times and wide, machined clutch braking surfaces provide an extra margin of safety under the toughest working conditions.





CONTROL ALL THE WAY with power lowering, standard on American 300 Series Crawler Cranes, makes setting of steel a safe as well as efficient operation. American's retractable high mast can be raised and lowered by the bail rigging without special equipment. All assemblies and grease fittings are readily accessible for routine adjustments and lubrication. Features like these have proved money-makers for cost-wise, safety-conscious contractors across the country.

FOR REAL VERSATILITY as a lifting crane, or with shovel, backhoe or dragline, you'll find the American 100 Series Truck Crane tops in its class. You can move this machine quickly and easily from job to job—travel over highways at speeds up to 35 mph. Low initial cost—12½-ton and 15-ton capacities.

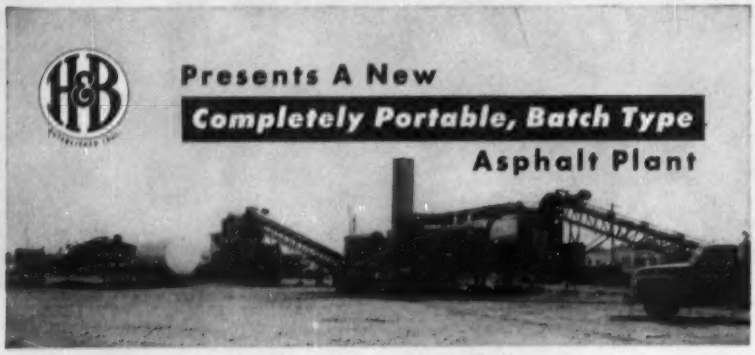


AROUND THE GLOBE on the world's biggest and toughest jobs, American products have been famed for engineering brilliance and production prowess for over three-quarters of a century. From gigantic, specially-designed Derricks, massive Revolver Cranes, efficient DiesElectric Locomotive Cranes, to the construction industry's top-producing Crawler and Truck Cranes—American leads the way. To put American dependability and prowess to work for you, contact your local American distributor, or write American Hoist & Derrick Co., St. Paul 1, Minnesota.

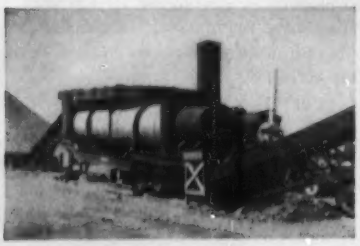
AMERICAN HOIST
and Derrick Company
St. Paul 1, Minnesota



PNEUMATIC PIN DRIVER powered by a single-unit air compressor operating off a Le Roi tractor drives form pins. Blaw-Knox subgrade cutter follows a few feet behind (left).



The H & B Mobile 40 (100-120 TPH Capacity)



Portable Dryer Unit



Gradation Unit, showing operator's platform.

- All Units Wheel Mounted
- No Crane Needed for Erection
- Meets All State Specifications
- All Piping and Wiring permanently installed with quick disconnects.
- All Advantages of Batch Plant
- No Shafts, Universal Joints, Chains, Gears, etc. All remotely located units driven with electric motors.
- Flexible Set-up Arrangement
- Complete Plant (tanks, oil heater, power units, piping, etc.) available from one source.

For complete specifications and information see your H & B distributor or write direct to

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wood blocks. If concrete footings are used, a 2x6x12 in. wood block must be placed under each joint, and the footings must be at least 3 in. deep, 6 in. wide, 10 in. long near the end of each strip, and spaced at not more than 3-ft intervals along the strip. With each type, stakes must be driven into the ground on the outside of the forms at 5-ft intervals, and on each side of every joint, and nailed firmly to the forms.

The base for the forms, whether steel or wood, is trimmed to proper elevation before the forms are placed in position. Before trimming, the surface of the subgrade or subbase should be as high as, or slightly higher than, the elevation of the base of the forms so that the forms rest on compacted material.

Trimming to proper elevation often is done with a form grader. The grader cuts a strip to proper elevation and rolls it to insure compaction. Stringlines are stretched between stakes, set to proper line and grade to guide the operator of the form grader. Stakes should be set at intervals not to exceed 50 ft on tangents and no further apart than 25 ft on horizontal or vertical curves.

In some cases, trimming is done by hand. Stringlines are set as for machine trimming, and the subgrade is cut by hand labor. It is customary to mark on the handles of shovels used to trim the grade the proper distance from the stringline to the grade.

After the form base has been trimmed to proper elevation, forms are placed on it, a pin set in each pin hole, and the forms aligned with a stringline. Form pins then are driven, either by hand or by compressed air jackhammers. With the forms at the proper elevation, wedges and lock-joint slide plates are driven in to hold them firmly in position.

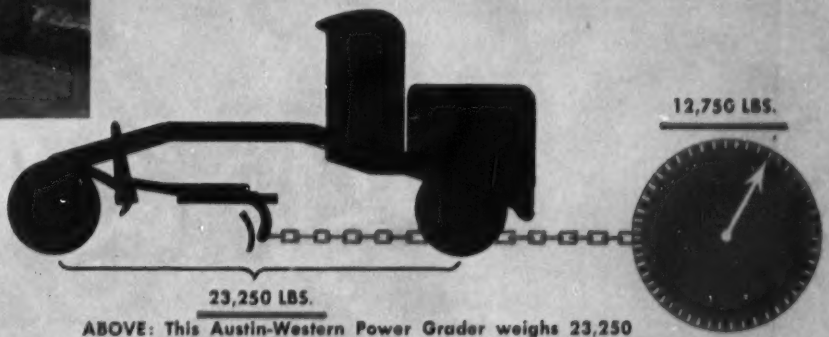
Specifications almost always require that forms rest on a firm base their entire length—not on pillars or columns of material. To insure this, material is tamped under the form either by mechanical tampers rolling on the form or by hand with tamping bars. The mechanical form tamper is a light, self-propelled gasoline-driven machine riding on the form. Oscillating tamping feet both inside and outside of the form force material under it. Hand tamping rods are

"Not How Big?" "But How Good?"



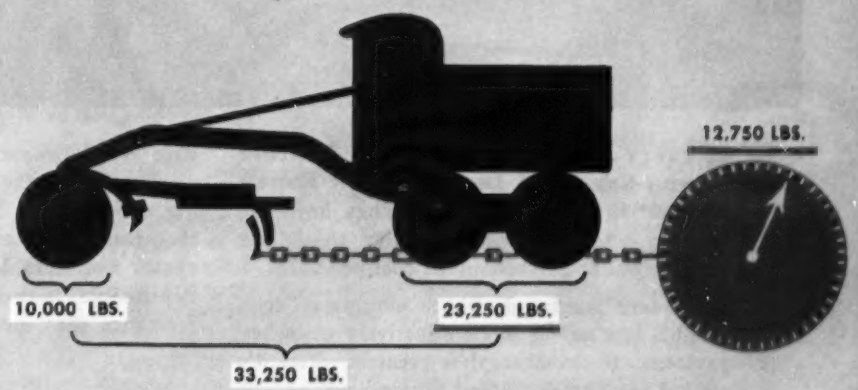
The ability of any motor grader to do hard cutting, and move big blade loads of material in the lower gears, where heavy work is done, depends entirely upon the amount of weight carried on *driving wheels*. Total weight has nothing to do with it.

Most for Your Money
From every standpoint . . . first cost, operating cost and upkeep . . . the A-W Power Grader gives you more for your money . . . moves 30 percent more material than an ordinary grader of equal weight and horsepower; and as much material as heavier, more expensive graders . . . as explained in the diagrams at the right.



ABOVE: This Austin-Western Power Grader weighs 23,250 lbs.—all carried on driving wheels. Working in average dirt, it has a blade pull of 12,750 lbs.

BELOW: To obtain the same blade pull, an ordinary motor grader would have to carry 23,250 lbs. on its *rear drivers*; PLUS about 10,000 lbs. on its *dead front end*, for a total of 33,250 lbs.



SIZE IS NOT THE MEASURE OF MOTOR GRADER PERFORMANCE

There's more to the story. All-Wheel Steer . . . another exclusive Austin-Western feature . . . makes the machine twice as maneuverable as graders with front steer only; while the Controlled Traction made possible by the teamwork of All-Wheel Drive and All-Wheel Steer moves more material . . . moves it farther . . . moves it faster. Your nearby Austin-Western distributor will be glad to tell you the whole story of "The Power Graders That Have Everything."

Austin-Western
Power Graders · Motor Sweepers
Road Rollers · Hydraulic Cranes

BALDWIN BLH LIMA-HAMILTON
Construction Equipment Division

Manufactured by
AUSTIN-WESTERN WORKS
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Baldwin-Lima-Hamilton Corporation
AURORA, ILLINOIS

In California ... And the World Over

BUCYRUS-ERIE WARD LEONARD ELECTRIC SHOVELS

Help Put The Lid On Rising Costs



A Bucyrus-Erie 150-B electric shovel loads fill on construction of a new freeway in San Francisco.

In every design and construction feature Bucyrus-Erie Ward Leonard electric shovels are built to save you money. They have the capacity and performance ability to deliver high output at an economical cost per yard.

Modern front-end design eliminates dead weight, lets power work effectively swinging payloads. Boom strength is greatest where it's needed most to withstand digging and swinging stresses. Ward Leonard control results in fast acceleration and deceleration, provides extra torque and ample usable power. Heavy-duty construction keeps maintenance costs down and adds years to machine life.

All over the world — in mines, in quarries, and on big construction projects — Bucyrus-Erie Ward Leonard electric shovels are being used to handle the toughest digging and loading assignments. Those who use them know that Bucyrus-Eries, with their fast operating cycles and durable construction, provide the dependable high-output and low-cost performance that means profitable operation.

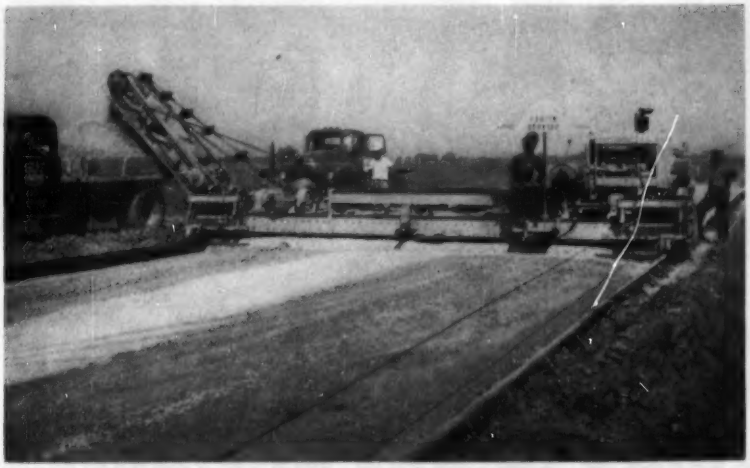
58L55



BUCYRUS-ERIE COMPANY

South Milwaukee, Wisconsin

75 Years of Service to Men Who Shape the Earth



SUBGRADER removes excess material and conveyor loads it directly into trucks. This is faster, cheaper than usual method of depositing material in windrow for removal.

equipped with feet similar to those of the mechanical tamper. In either case, an adequate amount of loose material should be provided both inside and outside the forms to insure proper filling of any voids under the form.

The rigidity of forms and firmness of support should be such that the forms do not deflect more than ¼ in. during operation of the finishing equipment.

However carefully the forms are placed and aligned, there will be minor variations from the proper elevation, particularly at joints. These can be found by sighting along the top of the forms.

To correct a low spot, the form is raised by loosening pins or wedges and placing a bar under the base. While the forms are thus supported, additional material is tamped beneath them to secure proper elevation. High spots can be corrected by removing one or more lengths of form and trimming off the high spot.

Forms should be oiled immediately before each use by brushing or spraying with used crankcase or form oil. This prevents concrete sticking to the forms and facilitates removal, cleaning, and re-use.

Forms should be removed as soon as the concrete slab has hardened sufficiently so that the slab is not damaged by their removal. Specifications usually require that forms be left in place at least 12 hr. Properly designed form pullers, with adequate bearing on the concrete, are essential if chipping damage to the new concrete is to be avoided during this operation.

Present practice is to load the forms with a truck-mounted crane and move them ahead for resetting. The forms should be thoroughly loosened from any spilled concrete, dirt, or other material before lifting in order to prevent bending.

No form should be used whose top is out of line by an amount greater than the allowable tolerance of the finished concrete surface. This is usually ⅛ in. in 10 ft. With proper handling, forms will retain the straightness that is essential to even surface finish.

Fine Grading

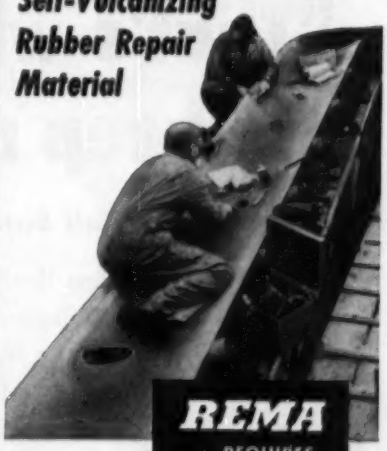
After forms are set, the subgrade is trimmed to the proper crown and elevation. This operation is called fine grading. On highway projects this usually is done by self-propelled mechanical subgraders which ride on the forms. These machines have oscillating or vibratory cutters which are adjustable to the desired shape of the subgrade. The cutters break up the upper portion of the subgrade so that material will be available to fill in any low spots. Excess material is pulled to the side and discharged outside the forms by conveyor blades. The subgrader also is equipped with a strike-off that leaves the proper amount of material to finish the subgrade to the correct elevation.

This operation can also be carried out by a subgrade planer, which has blade-cutters supported in proper position by transverse I-beams. These beams are attached to wheels which ride on the forms.

(Continued on page 128)

Use REMA to add years of life to your Belts

REMA is the New and Amazing Self-Vulcanizing Rubber Repair Material



REMA REQUIRES
- NO HEAT
- NO HEAVY EQUIPMENT
- NO CURING TIME DELAY

• REMA is not just another cold patch. REMA is vulcanization by chemical process. The repaired area is sealed with an abrasive resistant cover stock patch. No heat or heavy vulcanizing equipment required. Here's the astonishing advantage—*when repair work is completed belts may be returned to service immediately.*

• REMA seals out moisture, reduces mildew, rot and deterioration — the great enemies of conveyor belts. Your own maintenance man can quickly repair your belt — it doesn't take a skilled belt mechanic to use REMA.

• Used for repair of all types of damaged spots, edge wear and for covering metallic joints. Available in introductory kits or parts separately.

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REMA SELF-VULCANIZING RUBBER REPAIR MATERIALS

LOOK AT REO

"That's what it takes in a truck to keep rolling in our business"

...reports Hall Sand and Gravel, Inc., Denver, Colorado.

"We bought our first Reo in 1945, a used Dumper and it's still on the job. It proved to us that, dollar for dollar, there's no better truck to be bought.

"*Rugged strength* in a truck is a prime factor in our business, and Reo really has it. We wonder how they can take such punishment. No other truck has the guts that's built into these trucks.

"Our short-run stop-and-go hauling, requires more gear shifting than an over-the-road haul from Denver to Chicago. This is tough on a truck engine, and we've never had an engine failure in all the time we've been operating Reos."

Reo specializes in custom building heavy-duty trucks for tough jobs like those in the construction business. On or off-highway models with gas or LPG Gold Comet Engines—sixes or V-8's, from 107 to 220 h.p. Reo's advanced *short-stroke, wet-sleeve* Gold Comet engines are available in rugged Reo chassis or for replacement. *They are all backed by a 100,000 mile or 1 year warranty.*





THE HALL FLEET OF REOS delivers sand, gravel and concrete in the South Denver area. As much as 2,000 tons of sand and gravel and 338 yds. of concrete per day.

FOR "REAL GUTS!"

Hall's Reo "transit mix" model A630, 220 h.p., is equipped with a 6 yd. mixer (44,400 lbs. GVW). It saves 30 minutes per trip on a 20-mile run up an 8% grade, from Denver to Castle Rock. Rolls without laboring at 40 miles per hour on the highway.



REO MOTORS, INC.

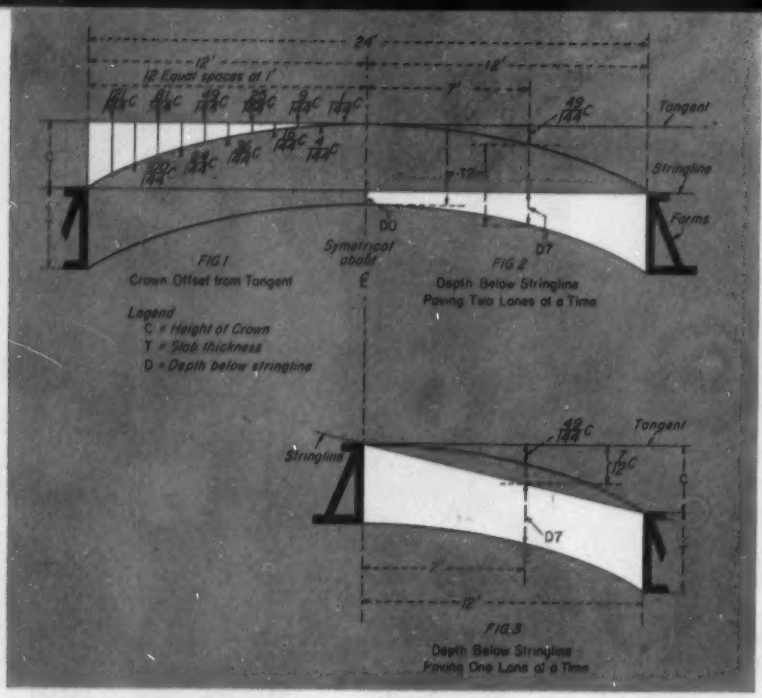
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REO

WORLD'S TOUGHEST TRUCK

TRUCKS, BUSES AND GOLD COMET ENGINES FOR ORIGINAL EQUIPMENT, INDUSTRIAL AND REPLACEMENT—GAS OR LPG



would be as shown in Fig 1. Thus the distance to the top of the subgrade from a line stretched across between the tops of the forms for a pavement, placed *two lanes at a time* would be determined by the computation:

"Depth (D) below top of forms at any point of a uniform thickness pavement constructed *two lanes at a time* is equal to thickness of pavement (T) minus the crown (C) plus the offset to the parabolic curve at that point."

Thus in Fig 2, at centerline, where offset is zero:

$$Do = T - C$$

At 7 ft from centerline (7/12 the distance from point of tangency):

$$\text{offset} = \frac{49\ C}{144}$$

$$D7 = \frac{T - C + 49\ C}{144}$$

$$= \frac{T - 95\ C}{144}$$

If the pavement is being built *one lane at a time*, the stringline between the two forms would not be horizontal because the outside form is lower than the one along the centerline by the amount of crown *C*. Therefore, the offsets must be determined from a slanting line as shown in Fig 3.

Thus the distance to the top of the subgrade under these conditions would be determined by the computation:

(Continued on page 132)

PAVING . . Continued from page 125

cut the subgrade even when it consists of well-compacted, dense-graded, granular material. Planers usually weigh at least 1,800 lbs (for widths of 18 to 24 ft) and have such strength and rigidity that they will not deflect more than ⅛ in. when the support shifts from the wheels to the center while cutting. Most specifications require that subgrade planers be supported by visible rollers. It is then readily apparent when a hard spot in the subgrade is encountered because the planer may ride up over it rather than cut it off.

Either a mechanical subgrader or a subgrade planer will leave a layer of uncompacted material on the subgrade. This should be consolidated by rollers or vibratory equipment. This material loses moisture rapidly, and water should be added before rolling in order to secure proper density.

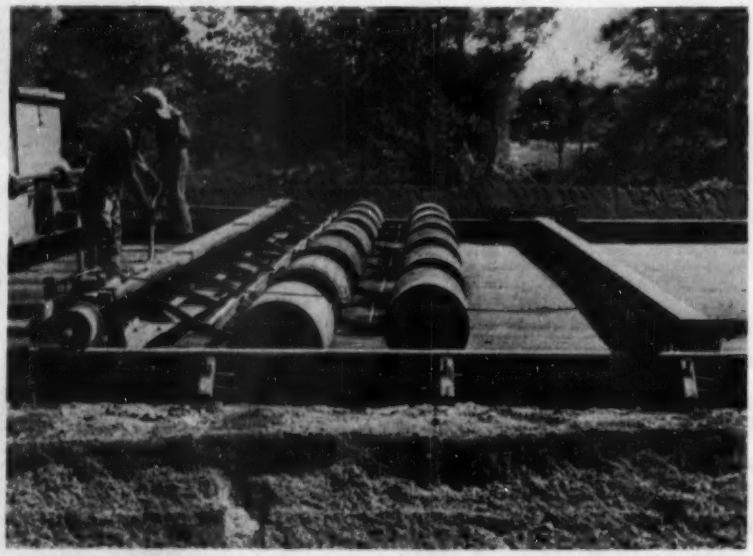
Checking Cross Section

After fine-grading operations are completed, the elevation and crown of the subgrade should be checked. This is most readily accomplished by a spike template, a device that consists of a rigid frame which rolls or slides on the forms with downward projecting spikes spaced not more than 12 in. apart. The bottom points of the spikes are fixed at the exact elevation of the subgrade.

The subgrade sometimes is checked by stretching a wire from left to right form. A disadvantage of this method is that, in a crowned pavement, the ordinates vary, depending on the distance from the form.

Curved crowns usually are set to a parabolic curve, as these are much easier to compute than circular curves. The variation between the two types is insignificant in the portion used in a pavement surface. In a parabolic crown, the offsets from a tangent are proportional to the square of the distance from the point of tangency.

For example, if one-half the width of a crowned 24-ft pavement is divided into 12 sections, the offsets to each point below the crown



LAWN ROLLERS and scratch template attached to the rear of a mechanical subgrader make the final compaction and check subgrade elevation on section of Indiana Turnpike.



"We Get Extremely Good Service with Your Oils"

VERNON POOL, partner in Pool Construction Company, Shawnee, Oklahoma



POOL CONSTRUCTION COMPANY is moving 2,600,000 yards of dirt on the northeastern Oklahoma Turnpike, slated for opening ceremonies in 1957. Forty-odd pieces of equipment are making eleven miles of finished grade roadbed—and a profit for Pool.

Each evening, under floodlights, Pool's maintenance crew services all the equipment with Phillips *66* Oils and Greases. Next morning, the units are ready to roll.

Says Vernon Pool: "We've used Phillips *66* Products since 1949. We have $1,500,000 in all kinds of equipment to protect and keep working. We have to have dependable oils and greases."

Pool Construction Company tackles a lot of dirt. Besides the northeastern Oklahoma Turnpike, Pool is also moving 1,200,000 yards on the Toronto Dam in Kansas. Other jobs include: Heyburn Dam, Oklahoma—800,000 yards; Turner Turnpike, Oklahoma—900,000 yards; Ft. Gibson Dam, Oklahoma—1,000,000 yards; Altus Air Base, Oklahoma—1,000,000 yards. Pool has done the dirt work on various Oklahoma highway projects totaling over 100 miles.

Vernon Pool adds: "We have a lot of equipment that's never had anything but Phillips *66* Oils in it. We get exceptionally little wear on all our engines with your oils."



Phillips 66 Heavy Duty Motor Oils offer you many advantages, on all kinds of jobs, in all kinds of equipment. You can benefit. Call, write or wire today: Sales Department, Phillips Petroleum Company, Bartlesville, Oklahoma. A Phillips lubrication sales engineer will give you complete details.

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(Bureau of Reclamation Photo)

FOR MODERN EXPRESSWAYS...

like the modern Detroit Expressway, with its many interchanges designed for easy, safe access to this high speed highway... a good example of the big job being done by the construction industry to help meet the country's highway needs.

(Abrams Aerial Survey Corp. Photo)

FOR BRIDGE CONSTRUCTION...

like the famous George Westinghouse Bridge in East Pittsburgh, Pa. The 460-ft. center span of this bridge is the longest reinforced concrete arch in the United States—and stands as a tribute to the skill and ingenuity of the designers and builders.

(Portland Cement Assn. Photo)

FOR COMMERCIAL AND RESIDENTIAL BUILDINGS...

like the Park La Brea housing project in Los Angeles. Costing $40,000,000 and providing living quarters for 13,000 people, this unit is the largest architectural concrete project in the country.

(Portland Cement Assn. Photo)







• Illustrated here are just four examples of the vast contributions to the progress of mankind being made by the construction industry. With the advent of modern engineering and huge construction projects such as these, specification concrete aggregate has assumed an increasingly important role. To meet the constantly growing demand for vast tonnages of quality aggregate, Symons Cone Crushers have long been the first choice of leading producers throughout the world. In addition, Symons Cones are widely used for preparing sand to meet the rigid specifications prevalent in concrete construction.

For in aggregate and sand production... *as in all of the great ore and industrial mineral operations the world over*... there has been no record to equal the performance of Symons Cone Crushers that have so consistently and efficiently produced great quantities of finely crushed product at low cost.

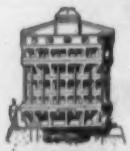
Long accepted by experienced contractors and producers for efficient stationary crushed aggregate plants, increasing numbers of successful operators of portable and semiportable crushing plants are now using these sturdy, economical Symons Cones for big capacity of fine product.

Whether you are a contractor, operator, construction engineer, designer or manufacturer, it will pay you to specify and use Symons Cone Crushers... as well as the other Nordberg Machinery for the construction industry... *all* designed and built to deliver maximum output at lowest possible cost.

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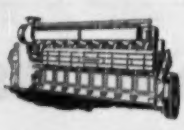
GRINDING MILLS



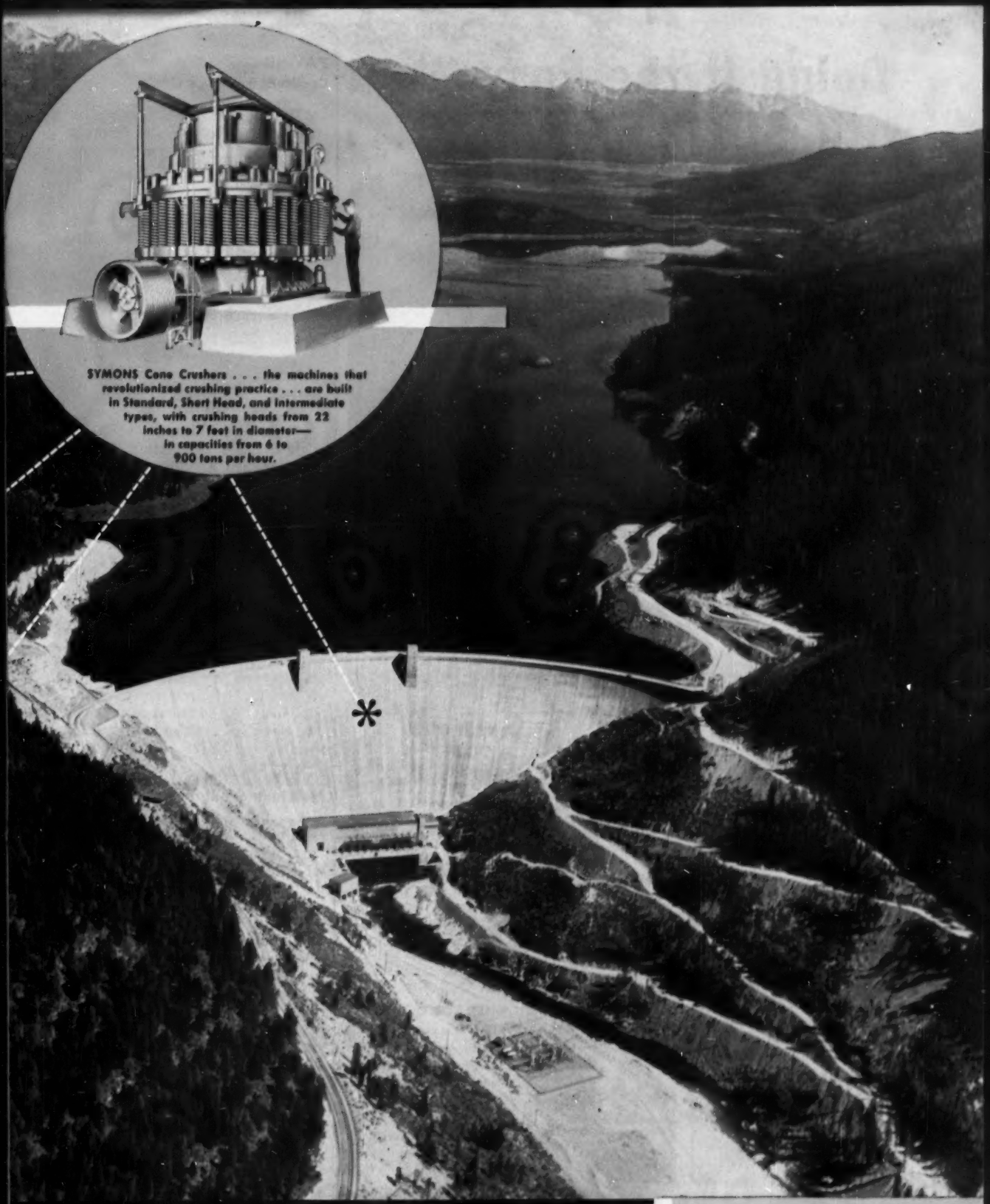
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SYMONS Cone Crushers . . . the machines that revolutionized crushing practice . . . are built in Standard, Short Head, and Intermediate types, with crushing heads from 22 inches to 7 feet in diameter—in capacities from 6 to 900 tons per hour.

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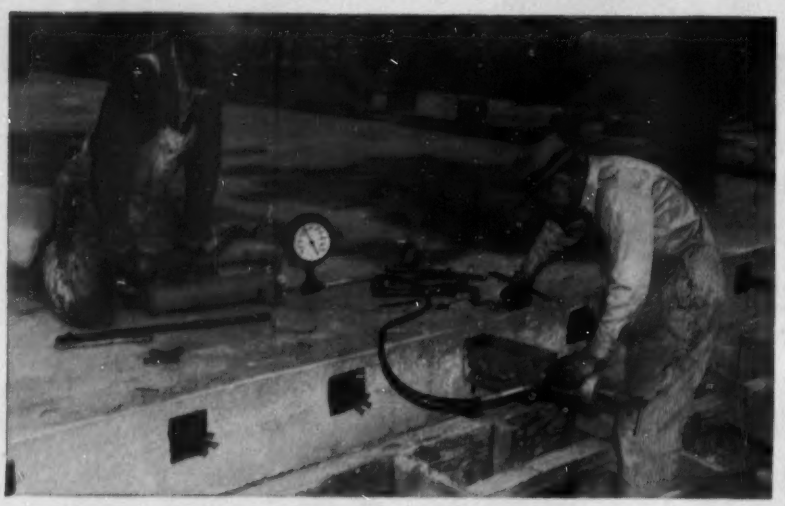
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Doing It the Easy Way with SIMPLEX JACKS...



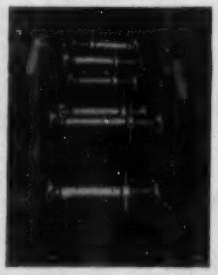
PRESTRESSING CONCRETE SLAB with a Simplex Re-Mo-Trol 30-ton hydraulic puller. When cured, 26' x 38' slab will be raised to form third story floor of school building. Intervening floors will then be cast, prestressed and raised into position. Only Re-Mo-Trol gives straight-line pull to prestressing wires through unique "center-hole", eliminates need for complicated back-up devices. Also has many uses as a powerful lifting jack on construction jobs.



15-TONS OF LIFT on either the cap or toe of this Simplex Model 24A jack is a feature that construction men like. Full capacity toe lets them lift from minimum clearances, cuts wedging and blocking necessary. Jack is ratchet lowering lever type; raises or lowers notch-by-notch —can't be tripped. 13" of lift.



TIMBER "STRETCHER" speeds shoring on foundation and tunneling work. Simplex Shoring Jacks, available in 25-ton or 35-ton sizes, are faster and safer than old-fashioned saw and wedge methods.



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SIMPLEX JACKS

SIMPLEX CONSTRUCTION JACKS are fully described in General Catalog 53. Write for a free copy.

TEMPLETON, KENLY & CO.
2509 Gardner Road • Broadview, Illinois

PAVING...

Continued from page 128

"Depth below a stringline stretched between top of forms at any point of a uniform thickness pavement constructed *one lane at a time* is equal to thickness of pavement, minus the difference between the offset of the stringline from a horizontal line through the center of the pavement and the offset to the parabolic curve from the same line."

Thus, for a point 7/12 from the centerline :

$$D_7 = T-(7/12\ C - \frac{49}{144}\ C)$$

$$= \frac{T-35\ C}{144}$$

These computations should be made to check the setting of spike templates and all subgrade-cutting equipment which operates on the forms.

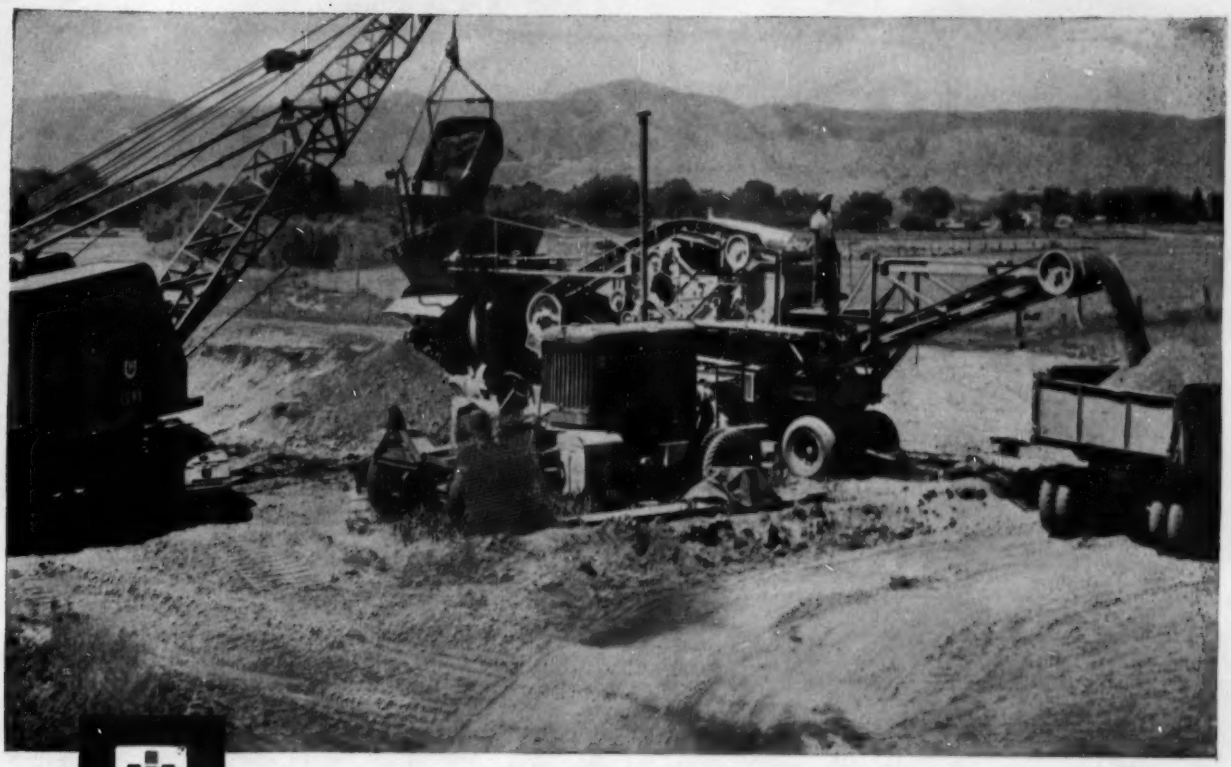
It is common practice to eliminate the crown in pavements on superelevated curves. Therefore, the subgrade is a uniform distance below a line stretched between the top of the forms.

For thickened-edge slabs, the elevation of the surface of the subgrade in the portion with uniform thickness is computed as shown above for a uniform-thickness pavement. Adjustment is made in the elevation of the subgrade in the thickened area adjacent to the forms.

Moistening Subgrade

Adequate moisture is necessary for proper compaction of the portion of the subgrade or subbase which is loosened during fine-grading operations. The presence of this moisture will prevent excessive loss of moisture from the concrete immediately after it is placed into the subgrade or subbase. Rapid loss of moisture from concrete at this time may cause plastic shrinkage. It also may cause volume changes in the subgrade which would create stresses in the pavement slab at a time when the concrete has not gained sufficient strength.

If some time elapses between the fine-grading operation and placing of the concrete, the subgrade should be moistened again. Light sprinkling just ahead of concreting operations is of some value, but thorough wetting the night before the concrete is placed is better. The subgrade should be moist when the concrete is placed on it, but it should not be muddy, and there should be no standing water.



International diesel power units provide dependable, low-cost power for shovels, crushers, etc. Here, McMillan Constr. Co., Denver, uses 115 hp IH diesel to power 1¼-yard dragline . . . 190 hp IH diesel on 200-ton-per-hour crusher.

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1. Full-flow lube oil filters lengthen engine life

New replaceable plastic impregnated full-flow filters increase engine life by removing all harmful particles from the oil before it goes under full pressure to engine bearings. Exceptionally large filter area extends filter change period to 500 hours under normal conditions.

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INTERNATIONAL INDUSTRIAL POWER

How to

CUT CLEARING COSTS

To help you clear land faster and cheaper, here are NEW IDEAS developed by clearing specialist Wade Lahar Construction Co. These "tricks" will help Lahar and their 22 International tractors finish a 23,500-acre job at Buford Dam 7 months ahead of an 18-month schedule.





One pass levels 18-inch trees—Where clearing to ground level is your primary job, Contractor Lahar recommends a big International tractor and V-shaped cutter. The cutter shown was designed and built by Herman Hackler, project manager, at Lahar's home plant in Mountain Home, Arkansas. Four 200 hp International TD-24's, so equipped, are handling most of the Buford Dam reservoir clearing near Atlanta, Georgia. In typical operation, they cut over so much land that 18 other International tractors are

1-to-5 slopes, 1,300 acres per month—Your TD-24 will efficiently clear trees from steep grades as well as from level ground. Here's what Herman Hackler, project manager for Lahar on the $1,611,560 contract, says about this big 200 hp, 8 mph crawler: "TD-24's high-low steering range keeps cutter against the tree until it falls, even on steepest slopes. This factor, plus the "24's" great power, excellent traction, and over-all balance, is letting us crawler-cut 99% of our Buford Dam job, despite slopes averaging 1-to-5, and, in some places, 1-to-4. Our fleet of *22 International tractors*—11 TD-24's (four of them with cutters), six TD-18's, three TD-14's, and two TD-9's—clears and rakes 1,300 acres per month. This production, in our opinion, could not be exceeded by any other make of tractor!"



Burn, turn with one tractor—On big jobs, Mr. Lahar suggests use of one medium-sized tractor to handle burning of brush piles. This leaves bigger machines free for production work. Note how clear the raked ground is behind tractor. When Lahar's job is done, some 14,000 acres will be completely cleared; about 9,400 acres partly cleared, with some trees left standing in the water to benefit future water life.



Team decking boosts output—Where terrain permits, three to six of Lahar's 22 IH crawlers team to rake and pile the cut brush and trees. This gives two advantages . . . (1) rakes, by catching both ends of fallen trees and brush, pick up material lying between tractors which normally would require separate pass . . . (2) one pass per team is all that's needed to provide a clean swath.





kept busy decking and burning. One pass of their 13-ft long, 14-ft wide blade slices saw-like through brush, pine, and mixed hardwoods up to 18 inches in diameter. For scattered trees up to 12 inches in diameter, a similar though smaller cutter is used on a 66 dhp International TD-14A. Both TD-24 and TD-14 have a canopy of 2 and 2½-inch pipe. This protects operator and machine. Entire canopy and cutter assembly pins to regular A-frame . . . can be quickly detached and interchanged with standard or other special blades.

Blade "saws" larger trees—If your clearing work involves trees larger than 18 inches, here's another idea from Wade Lahar Construction Co. Using same mild-steel cutter blade as on smaller trees, have TD-24 operator "see-saw" back and forth a few times to cut the trunk. Just a few seconds' work with the 64,000-lb TD-24 will topple the tree.







Careful in-the-field maintenance boosts output, too. Left, mechanic uses compressed air to blow dirt and leaves from TD-24 radiator core. Right, special steel tooth, 2½ ft long with 18-inch overhang, is welded to TD-24 blade. Four teeth and top blade extension are used per raking tractor.

Winches logs from swamp—Clearing from marshy areas may present you with quite a problem too. Wade Lahar Construction Co does this work, 1% of their 23,500-acre Corps of Engineer job, with chain saw crews and winch-equipped TD-9 and TD-18 crawlers. After winching in, tractors skid timber to central area.

International Industrial Power

makes every load a pay load

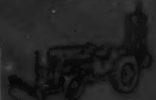
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IT'S A **Skid-Shovel**

with Drott's exclusive *triple-power*, pry-over-shoe break-out action—plus 42° ground-level bucket roll-back! The Skid-Shovel position also gives you speedy straight-forward loading—time-gaining, strain-saving Skid-Shoe load transport!

EXCLUSIVE NEW 2¼-YARD *gives you 4-machine utility ...*

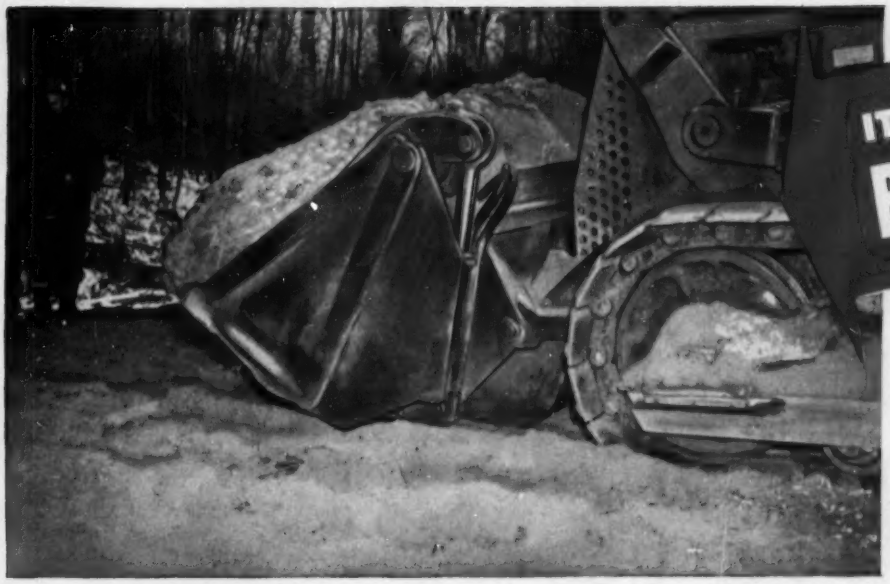


IT'S A **Clamshell**

a "wide-opener" that gives you a speedy bucket-fill on stockpiled loose materials, even in cramped quarters. And as a clamshell, the Four-In-One gives you a 30-inch dumping height advantage over ordinary roll-forward bucket dumping.



Move the Four-In-One "machine-selector" lever with finger-tip ease, and prove *versatility unlimited* . . . get the job-range of a machinery yard full of costly, limited-duty rigs! Test the tremendous excavating power of exclusive pry-over-skid-shoe break-out action. Compare how exclusive shock-swallowing Hydro-Spring speeds production, protects performance. Try this big new 2¼-yard Four-In-One, or the TD-6 one-yard or TD-9 1½-yard model. Ask your nearby International Drott distributor for a demonstration!



IT'S A **Bullclam**

with famous Drott Bullclam Shovel efficiency on all Sanitary Landfill operations—*plus* unequalled ability to *strip, grade,* and *spread,* using clam lip control. And as a Bullclam, the Four-In-One can *self-load* like a carry-type scraper!

TD-14 FOUR-IN-ONE

for one moderate investment!



IT'S A **Bulldozer**

with clam open in bulldozing position, the big-capacity earth-rolling blade has cutting edge and shoes on the ground. You regulate depth of cut with ease and accuracy by hydraulic "radius control" of blade pitch (forward and backward).

International Harvester Company, Chicago 1, Illinois

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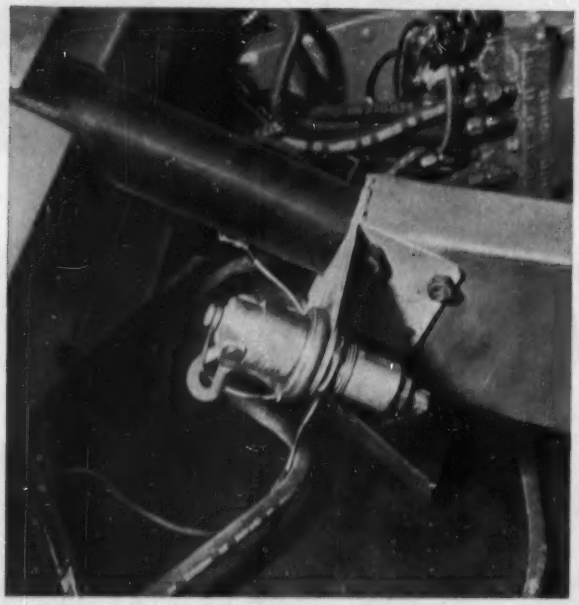
The Engineer's Field Report

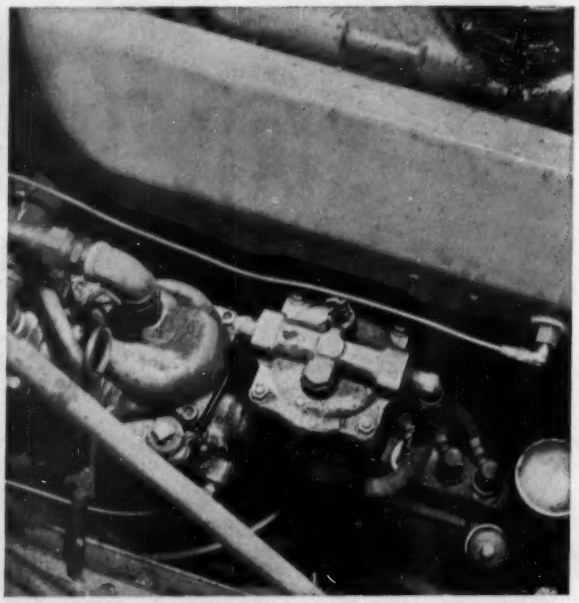
CASE HISTORY

PRODUCT Chevron Pressure Primer System

FIRM Consolidated Freightways Inc., Portland, Oregon

Pressure Primer System starts diesels on 1st or 2nd turn with regular batteries—at minus 40°





BELOW ZERO starting temperatures are common 5 months a year for Consolidated Freightways equipment operating in Mountain and Plain States. Two hundred and forty-four of the company's tractors are equipped with the Chevron Pressure Primer System. Since this installation, rigs start on first or second turn at 40° below zero—using regular equipment batteries! Normally in these sub-zero temperatures, regular batteries give out after about 4 turns. Sure starts plus the fact engines are primed with Chevron Pressure Primer bulbs, controlled from within the cab, saves Consolidated Freightways important man-hours and speeds operating schedules. Picture above (left) shows a Chevron Pressure Primer Discharger mounted on steering column. Highly volatile priming fuel is atomized through tubing into manifold (right) under 250 lbs. pressure.

Why Chevron Pressure Primer System helps starting

Volatile Chevron Priming Fuel atomizes in induction system at temperatures as low as -65°F. Pressure or weakest spark from engine fires mixture.



Simple, rugged discharger prevents fuel leakage. Small, safe steel bulbs protect fuel from water and dirt.

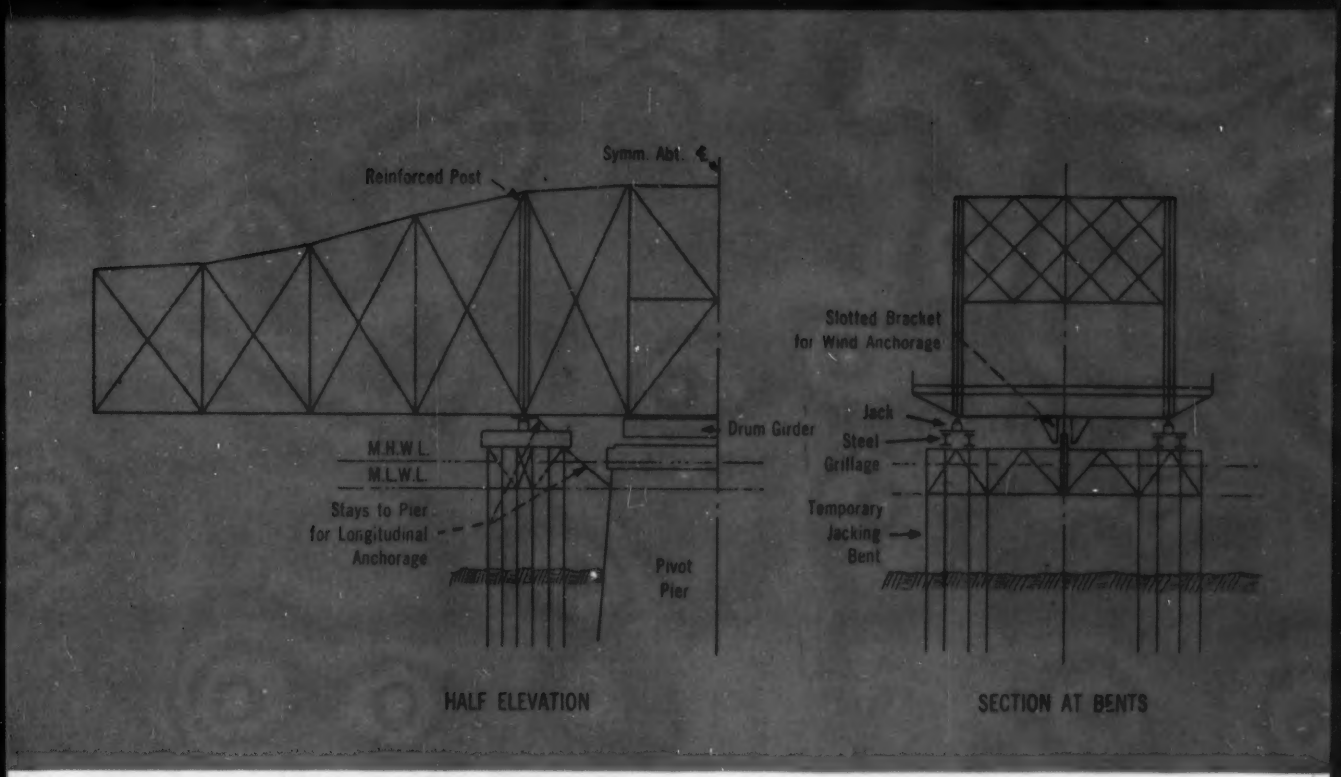
FREE FOLDER tells you more about Chevron Pressure Primer System and how to install it on different engines. Write or ask for it today.

FOR MORE INFORMATION about this or other petroleum products of any kind, or the name of your nearest distributor, write or call any of the companies listed below.

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THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey • THE CALIFORNIA COMPANY, Denver 1, Colorado



Old superstructure is jacked on to temporary pile bents before . . .

Swing Span Gets New Mechanism

When span is jacked on to piles, old mechanism is burned out. Pivot pier cap is then rebuilt, and pieces of new mechanism are snaked in one at a time and assembled.

HOW DO YOU REPLACE the entire rotating mechanism of an old swing-span bridge without removing the superstructure?

You simply drive piles through open areas in the deck, jack the bridge slightly, and transfer the load to the piles. Then you cut out the old machinery and install the new.

It sounds easy—but it's not, especially when the contractor has to work against tides, low headroom, heavy handling, and extremely close tolerances. But that's the kind of job that Peerless Construction Co. of White Plains, N.Y., did on the old Bridge Street Bridge in New Jersey.

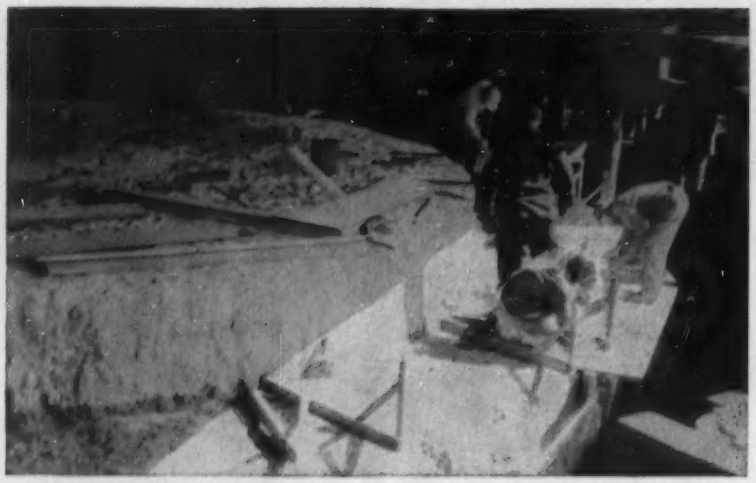
The four-lane structure spanning the Passaic River at Newark and Harrison was closed several years ago. Its rotating mechanism had become so worn and warped that the span would no longer turn. But increasing traffic demanded the bridge be put back in service, and an economical reconditioning plan was developed.

Peerless was awarded a $350,000 contract to replace all swinging mechanisms. This included the rollers, drum girder, center casting, radial struts, and track castings. The new machinery was larger than the old, and this made it necessary to cut down the existing masonry and concrete pivot pier. Final problem was lowering the spans on the new drum girder, with shims added to make the span meet the approaches.

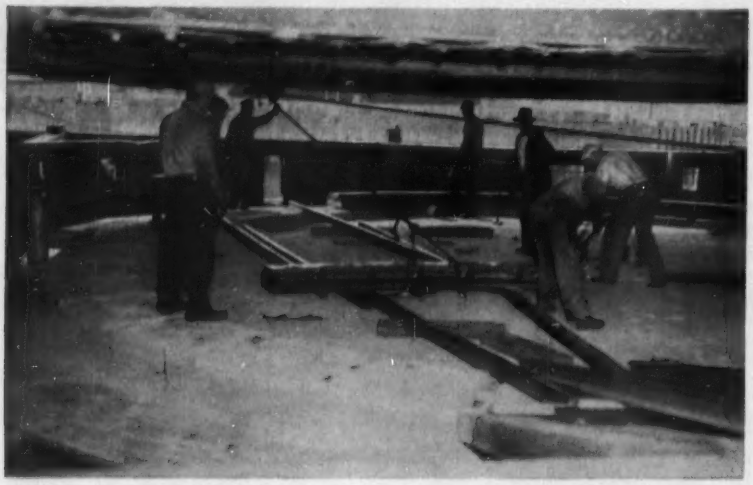


DERRICK on railroad lighter lowers roller assembly on to rail skids. Second derrick line pulls piece into position. Half of channel is closed to give contractor working area.

Peerless began the job by ripping up four sections of concrete deck and steel buckle plates to



CONCRETE PIVOT PIER is cut down and stepped back to accommodate new mechanism. Workmen erect forms for pouring outer lip which houses more than 100 bolts for anchoring track. Locating bolt sleeves was tough layout problem. Rotating template did the job.



HEAVY TRACK SECTION IS SKIDDED across rails by cable line reeved through blocks to railroad lighter derrick. Track is set on accurately placed steel shims bolted to pier cap, and then filled underneath with special dense grout. High tides often flooded cap.



LOW HEADROOM makes it tough to skid quarter section of drum girder under bottom chord of truss. Heavy piece will be bolted to radial struts, and then entire mechanism will be rotated quarter turn to permit struts to receive second section. Each section will be installed this way.

BRIDGE STREET BRIDGE...
Continued

permit driving pile jacking bents. Subcontractor Allen N. Spooner & Son, Inc., brought in a derrick boat and drove 55-ft timber piles with a Vulcan No. 6 hammer.

Piles were driven 24 to a bent. Two bents on each side of the pivot pier were braced against each other with a framework of 14-in. timbers. They also were braced against the pier.

When the pile bents were completed, Peerless placed heavy grillage beams at the center of each bent to support the jacks which would raise the old span off the pivot pier. Besides the grillage, several steel wind braces were placed between the bridge and the pile framework. All braces were slotted to permit the bridge to be jacked up and down.

Reinforced Posts

Another job that had to be done before jacking could start was the reinforcing of the vertical truss posts and connections that would take most of the jacking load. The reinforcing consisted of heavy angles fastened with high-strength bolts to give the posts a strong box-type cross section.

The bridge was now ready for jacking. But Peerless knew that only a slight lift would be needed to free the old drum girder, permitting it to be cut away. So, instead of bringing in four expensive high-capacity jacks, they used a combination of two smaller jacks and wedges to raise the spans slightly, one corner at a time. This transferred the load from the pivot pier to the pile bents, and the drum girder was freed for burning out.

When the old machinery and parts were removed, crews drilled off about 2 ft of concrete and masonry from the top of the pier to accommodate the larger mechanism.

Rebuilding Pier

Now the tricky job of rebuilding the old pier began. It was a tough problem. Besides the difficulty of limited headroom, the contractor also faced a tough forming and layout job. There were two main problems. First, more than 150 anchor bolt sleeves had to be positioned with extreme accuracy in a stepped-down outer section of the pier. And second, a concrete lip had to be formed around the outside of the pier.

Locating 150 bolt positions and



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NEW ROTATING MECHANISM is completely assembled at Eddistone, Pa. plant of Baldwin-Lima-Hamilton Co. and tested. Contractor then supervises knocking down of unit for tricky reassembling at bridge site in Passaic River at Newark, N.J. Huge 100-ton mechanism consists basically of track casting, center casting, live ring roller assembly, radial struts, and drum girder.

then tying sleeves accurately at each position would have been very difficult by ordinary methods. But Peerless found a simple method. They built a wood templet with small holes pin-pointing the positions of ten bolts. Because the bolts were laid out in two circles, the template was fixed to a carrier that pivoted about the exact center of the pier. In this way, the template quickly located the sleeves, which were then grouted at the base and held rigidly on top with a plywood support. The device was a big time saver. When the new cap was poured, the sleeves were removed. Later, the anchor bolts were inserted through holes in the track and into loose grout.

Overhanging Lip

The other tough problem was an overhanging lip about 1½ ft wide. To form it, Peerless bolted channels to the base of the stepped-down area and allowed them to overhang. Forms were bolted under the overhang to support the base of the lip. Brackets attached to the end supported vertical plywood forms for the side of the lip. Additional brackets projected beyond the lip to support a wood walkway. Segments of the pier cap were poured one at a time until the concrete part of the pier was completely rebuilt, including lip, and walkway brackets.

With the pier completed, the next job was to assemble the new rotating mechanism. The mechanism consisted basically of track, a live ring roller assembly, center casting, radial struts, and drum girder. The total weight was 100 tons, and even though the unit was broken down, the individual pieces weighed from one to eight tons.

To handle the heavy pieces, Peerless took advantage of the derrick on the railroad lighters that brought in the machinery. Because the customer is allowed to use the derrick free for 48 hr, the contractor planned the job so that the pieces could be unloaded onto rail skids leading to the pier. When a piece was set down on the skids, a line from the derrick was reeved through blocks under the bridge to pull the piece into position.

All pieces except the drum girder were meticulously fitted into place. The big girder could not fit through the narrow space. At this point, four Dudgeon 530-ton hydraulic jacks were placed between the bridge and the pile jacking bents. They raised the span about 6 in. and transmitted the load temporarily to shims. A quarter section of the drum girder then was pulled in on skids and bolted to the radial struts. Headroom was so limited that the piece had to be tilted to pass under the bottom chord of the truss.

When the first quarter section was bolted in place, the mechanism was turned one-quarter to bring a second group of radial struts in position to receive the next girder section directly off the skids. This system was used on all four quarters. It greatly simplified assembly.

As soon as the rotating mechanism was completely assembled, the contractor was ready to lower the span on the drum girder. Precise surveying and calculations determined the exact shim thick-

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Torque can be quickly and easily set, using the jig as shown above. The torsion bar automatically shuts off the tool when the nut running resistance becomes equal to the stress preset in the torsion bar.

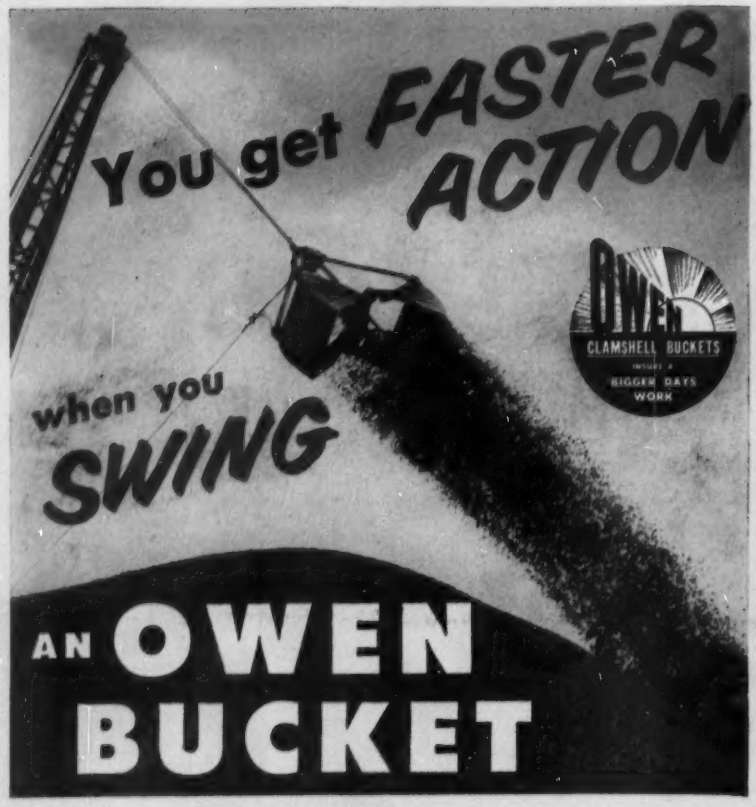
- **POSITIVE TORQUE CONTROL**—a revolutionary use of a rugged steel torsion bar for precision control of torque—combined with the power and speed of the Impactool.
- **SIMPLE TORQUE SETTING**—torsion bar adjusting sleeve is clearly calibrated for changing torque with easy-to-use torque jig.
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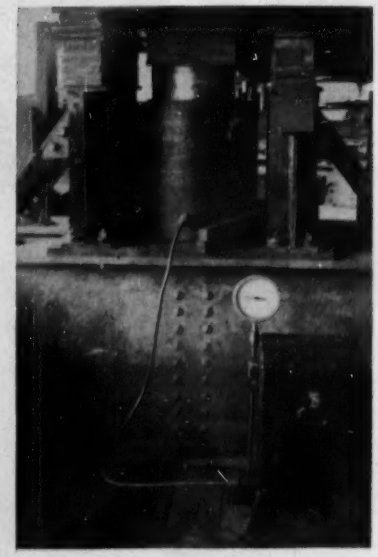
FASTER Digging ACTION
with variable, multiplied closing power for excavation;

FASTER Loading ACTION
by reason of correctly engineered bowl designs with balanced power on each jaw;

FASTER Discharge ACTION
The combination of adjustable reeving and weight concentration in area surrounding lower sheave block exerting a direct pull on the cable, results in quicker opening and faster dumping.



BRIDGE STREET BRIDGE...
Continued



530-TON Dudgeon jack is one of four that lower bridge on to new drum girder. Layers of shims flanking jack are added or removed as needed to support truss if jack fails.

nesses needed on top of the drum girder to make the ends of the span meet the approaches. Only one adjustment was required before the four big jacks lowered the span for good.

The rest of the machinery was connected, and once more the span was swinging over the river. Pile bents then were removed, the holes in the deck filled in, and the entire surface repaved.

Power for turning the bridge originally came from a steam engine housed in the operator's shack in the trusses. A close analysis showed that the engine could be rebuilt at less cost than it could be replaced with an electric motor. Reuther Engineering and Machine Works of Newark overhauled the engine completely. They also rebuilt the locking and wedging machinery.

Personnel

John Fennel was superintendent for Peerless Construction Co., which is headed by Charles Tyroler, president. L. Moratto was resident engineer and H. Fisher was project engineer for Hardesty and Hanover, consultants. County Engineer of Essex County is Curtis Colwell, and H. J. Thourot is engineer of Hudson Country.

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THE LOW-COST MOTOR GRADER THAT OFFERS more of everything...



more PRODUCTION-BOOSTING FEATURES

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GASOLINE — 50 brake hp. Bare grader weight —8,800 lb. Four forward speeds to 25.6 mph, one reverse to 3.3 mph.

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Plus one-piece tubular frame, tandem drive, real operator comfort, hydraulic blade lift.

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Rear-mounted 5/8-yd loader for fast, low-cost handling of materials.

plus snowplows, completely enclosed standup cab, hydraulically operated mower.

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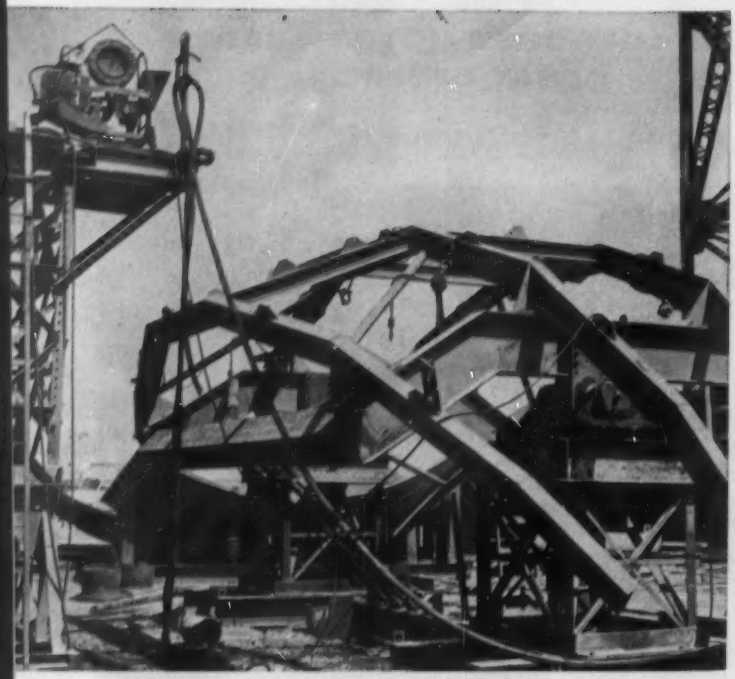
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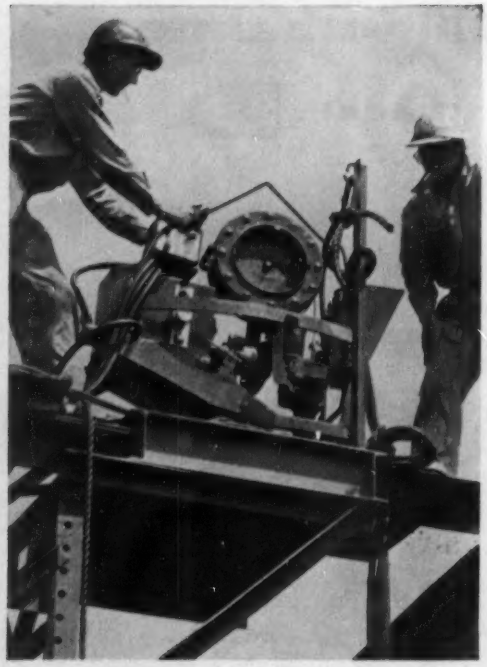
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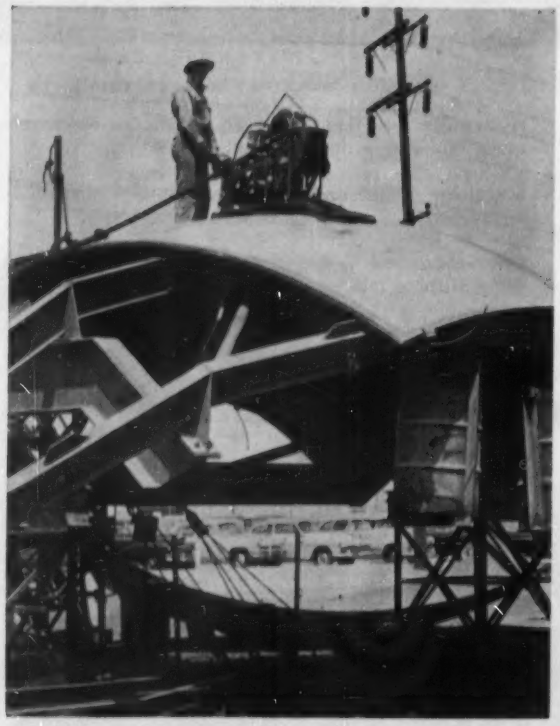


WELDING JIG for prefabricating spherical section of steel tank turns on horizontal axis at the exact speed of the welding unit.



WELDING HEAD moves from its scaffold rest onto the jigged section. Welding speed is about 0.8 ft per min

Jig Rotates to Speed Welding



OPERATOR controls jig motion by a switch. A small level glass mounted on the welding unit helps keep it on an even keel at all times while the jig rotates at right angles to the weld seam.

By J. B. McCORMICK,
District Engineer, The Lincoln Electric Co.

AN UNUSUAL WELDING JIG is at work on construction of compressed air storage facilities for a new aircraft-testing wind tunnel near Los Angeles, Calif.

Pittsburgh-Des Moines Steel Co., structural contractor for the $4.5 million test facility, designed the jig to prefabricate components for eight spherical air tanks of all-welded steel construction. Components weigh from 6 to 10 tons.

The jig is composed of a number of structural steel I-beams arranged to rotate on an horizontal axis. The sections of plate to be welded are attached to these I-beams so that the weld seam runs at right angles to the axis of rotation. The jig is rotated by block and tackle to an electrically driven tugger hoist.

A standard Lincolnweld automatic head makes the welds. After the spherical sections are attached to the jig, the self-propelled welding head is shoved onto the plates. Welding speed is approximately 0.8 ft per min. The head remains level at all times while the jig turns under it. The welding operator controls jig motion by a switch. A small level glass mounted on the welding unit indicates when its forward motion has carried it beyond a level position.

Welding is by a submerged arc process with the cover flux supplied from a hopper on the welding unit. The flux is recovered, cleaned, and reused. Mild steel, L-60 welding wire of 3/16-in. dia and 840 flux are used. Each foot of weld requires approximately 3 lb of rod. The finished weld is clean and smooth.

The spherical sections are 1 3/16-in. mild steel

STAYS STABLE ...Hot or Cold!

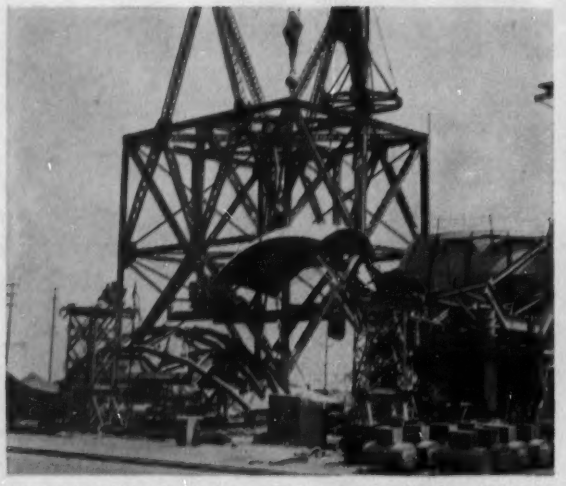


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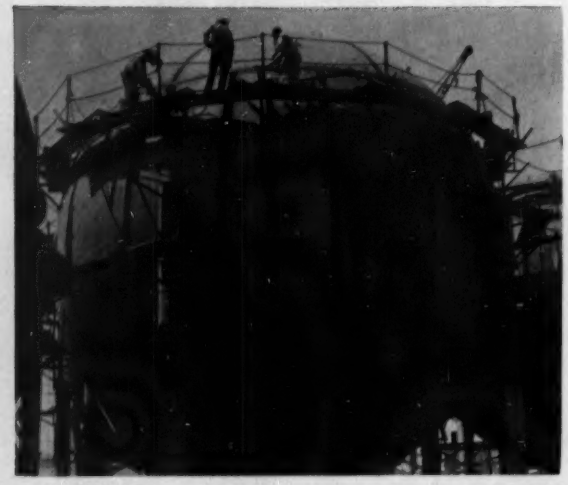
JET LUBRICANT saves money, too, because it lasts longer . . . reduces lubricant consumption . . . helps to lower power consumption. No heating is required to make it usable direct from its container.

There are *more* reasons why the right grade of JET LUBRICANT and other Sinclair products can improve your operations. Why not let a Sinclair Lubrication Engineer help solve *your* lubrication problem. *There's no obligation.* Contact your local Sinclair office or write Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N.Y.

SINCLAIR JET LUBRICANT



STIFF-LEG DERRICK swings a prefabricated section from the welding jig into position. Each spherical section weighs 6 to 10 tons.



HAND WELDING prefabricated sections into place completes the assembly. Inside diameter must meet a 1/16-in. over-all tolerance.

JIG WELDING...
Continued

plate performed on a dishing press at the Pittsburgh-Des Moines' Santa Clara, Calif., plant. Edges of each section are beveled before delivery to the construction site so that a full penetration butt weld can be made.

After prefabrication on the welding jig at the job site, the sections are swung into place by a 40-ton stiff leg derrick. They are tacked, and finally hand welded. Four prefabricated vertical columns support the spherical tanks. Each tank has an inside diameter of 36.5 ft, a capacity of 291,000 gal, and is tested at an air pressure of 200 psi. When assembled the inside diameter must meet an over-all tolerance of 1/16 in.

The wind tunnel is under construction for North American Aviation, Inc., near International Airport at Los Angeles. It will be the nation's largest privately-owned wind tunnel of its type.



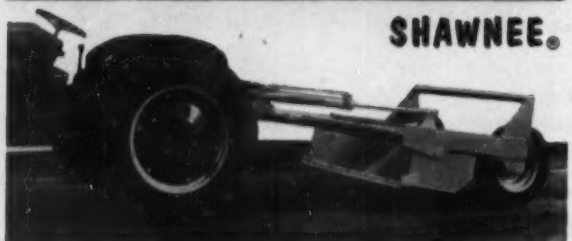
"FOR MY MONEY, SHAWNEE'S O.K.!"

Earl Russell, Supt.
Water Department
Blue Springs, Missouri

As superintendent of a Water Department, Mr. Russell has many digging jobs to do. He says, "I am inexperienced in the operation of this equipment, but it is simple to operate and really does a rugged job. We have been digging and breaking concrete with this equipment. For my money, it's O.K." The Shawnee Scout owned by the Blue Springs, Missouri, Water Department is mounted on an International Harvester "300" Utility Tractor. It carries a Shawnee Special "heavy duty" Loader on the front.

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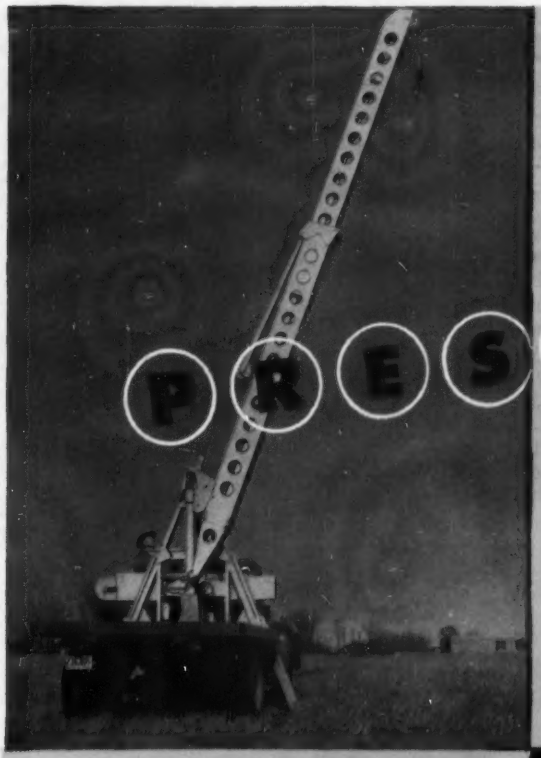
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*Hydraulic telescopic boom available as optional equipment. Standard tubular boom, shown above, telescopes manually from 12 to 17 to 22 feet.



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Contractor Labor Relations...

by LEON B. KROMER, Jr.

You Can Prevent Some Disputes

This is the second in a CM&E series of articles on how to prepare in advance for your next collective bargaining session.

YOU CAN SAVE time, trouble, and money by making sure that your collective bargaining agreement is worded clearly. Too often some clauses are so poorly written that a contractor will accept an erroneous interpretation of it without question. The result often is unnecessary extra cost, or a labor dispute, or both.

If there are clauses in your agreement that seem confusing or ambiguous, your negotiating committee should review them and submit proposed revisions to the union committee. Many points can be cleared up easily in negotiations. Here are some provisions of union agreements you should look over carefully:

Hours of Work

Many disputes arise on the job over the interpretation of the section of the agreement spelling out the hours of work. Here's an example of a poorly written clause that may lead to a dispute:

"Eight hours shall constitute a work day. The hours of employment shall be from 8 am to 12 noon and from 12:30 pm to 4:30 pm, Mondays through Fridays."

Does that mean you must pay overtime if you work a crew into part of that half-hour lunch period? Suppose a load of concrete arrives at the job at 11:40 am, and you have to work some men beyond noon. If this clause is in the contract, you probably will have to pay overtime.

Here's a better way to write that clause:

"Eight hours shall constitute a work day. The hours of employment shall be from 8 am to 4:30 pm with one-half hour for lunch within the hours of 12 noon and 1 pm, Mondays through Fridays."

If you intend to pay overtime for work before 8 am and after 4:30 pm, make that clear in this section of the agreement. One good way to do this is to put the entire overtime clause of the agreement just after the clause setting forth the regular working hours. But be sure your agreement makes provision for certain categories of employees who must work some time outside regular hours to be paid the straight time rate. In the case of mortar mixers and mortar carriers for example, that provision may be worded like this:

"Mortar mixers and mortar carriers may be required to start work 20 minutes ahead of time in the morning at the regular straight time rate and adjust their lunch schedules accordingly in order to have mortar ready for masons, provided they stop work 20 minutes before the normal quitting time."

Overtime

Some agreements provide that time and one-half shall be paid for all overtime and for all time worked outside of the normal working hours, whether or not the employee concerned works a total of eight hours in that day. Agreements also usually provide for the payment of double time for work on holidays and Sundays.

If your agreement follows this pattern, make sure that the overtime provisions are clear to avoid disputes over which rate should apply in any particular case. If you agree to pay double time for work on holidays, be sure the particular holidays are named.

Here's an example of how this clause might be written:

"All work performed before 8 am and after 4:30 pm on regular work days and all work on Saturdays shall be paid at the rate of time and one-half. Double time shall be paid for all work performed on Sundays and the holidays set forth in Article X." (See below).

Paid Holidays

Contractors more and more frequently now face union demands for payment of straight time wages for time not worked on holidays. Unions contend their members need holiday pay to protect them against loss of pay when a holiday falls within the regular work week.

There are three points contractors should pay particular attention to in writing a paid holiday clause:

- Be sure you don't commit yourself to pay for holidays that fall on Saturday or Sunday. It is the intent of this clause to prevent loss of pay, so it should indicate clearly that it applies only to holidays that fall within the regular work week.
- Be sure the language is clear. You want to avoid any indication that employees who must work on a holiday should receive triple pay.
- Set up some way to determine which employees qualify for holiday pay. If an employee works only one or two days in the week in which the holiday falls, maybe he should not be entitled to pay for not working on the holiday.

Here's how these three points may be covered in one clause:

"Employees shall receive eight hours pay for time not worked on the following holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day, provided that they work the last two regular work days before and the regular work day following the day on which the holiday falls. Employees required to work on any of these holidays shall be paid double time for all hours worked. If required to work less than eight hours on any of the specified holidays, the employee shall be paid the straight time rate for the balance of the eight hours."

Reporting Time

Some agreements do not mention reporting time, but many do provide that an employee who reports for work is entitled to some pay.

If the clause merely states, "A minimum of two hours pay shall be paid when members report for work," you have no protection at all should weather conditions, for example, prevent work.

A better clause is the one contained in the General Working Rules of the International Association of Bridge, Structural, and Ornamental Ironworkers:

"When a member of the union is ordered by the employer or his representative to report for work

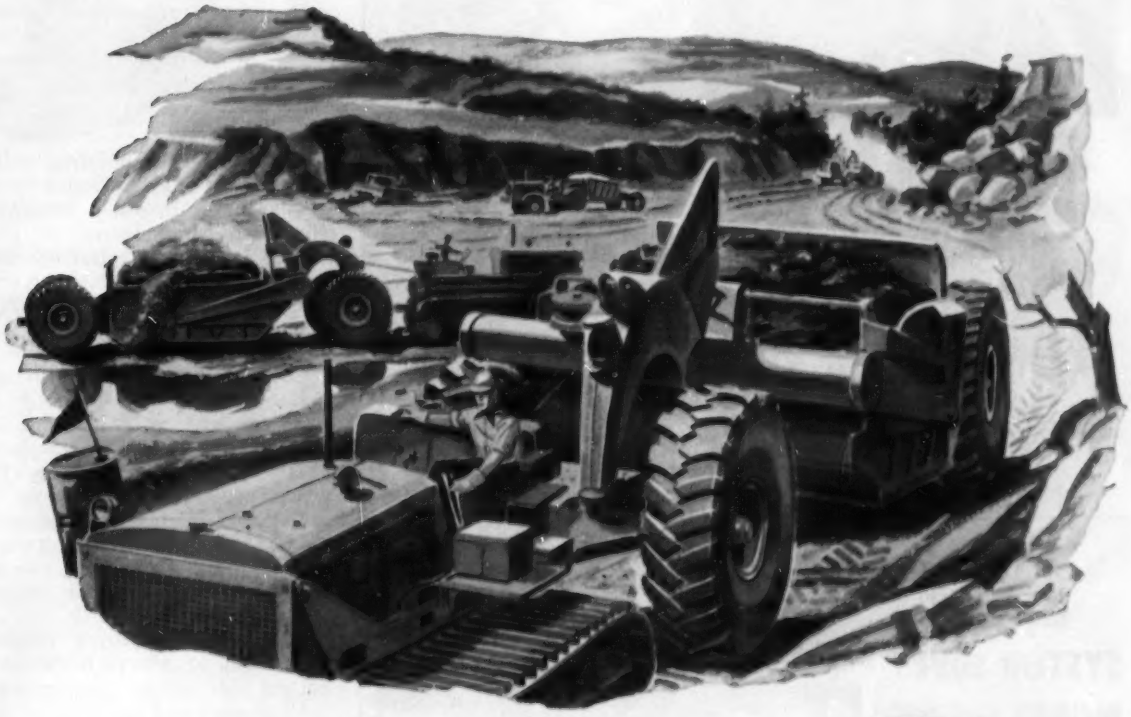
(Continued on page 152)

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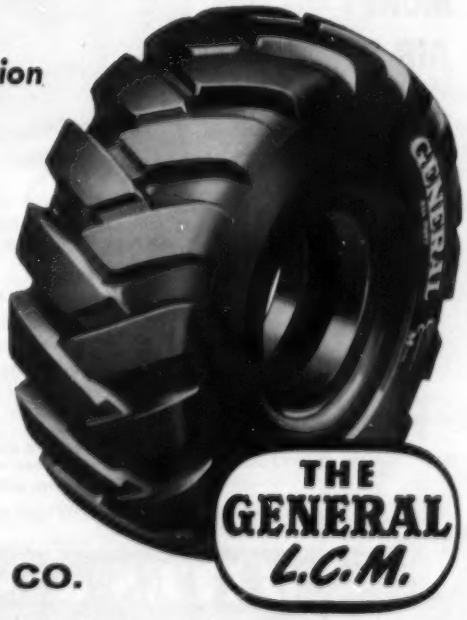
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This Jaeger pumps all the water a 2" hose can handle Hi-performance Jaeger Model 2PN will actually pump all the water that can be pulled through a 2" suction line under average working conditions. Delivers 10,000 gph when operating at only 2400 to 2550 rpm (as much as 400 rpm below the speeds of similar ordinary pumps). Weighs only 160 lbs. on base, 190 lbs. on pneumatics. For complete information on this model or other Jaeger pumps, see your Jaeger distributor or send for Catalog P-4.

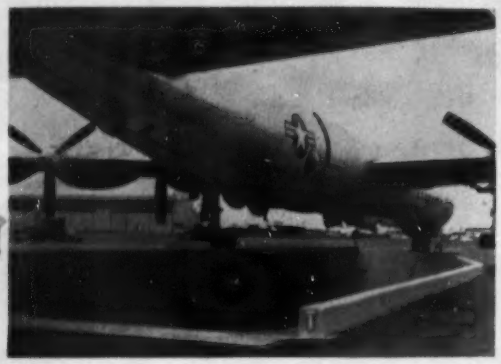


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Warner & Brown, Inc., of Spokane, Washington, used Gates 2 x 4 Break-back Ties for construction of this FICON pit at Fairchild Air Force Base. Panels were used to obtain the smooth finish required on this battered-wall job. The contractors and the Government inspectors were pleased with the results.

"Our savings have been quite substantial with the use of Gates form ties over methods previously used..." says Richard E. Brown, president of the firm.

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and then, through no fault of the member, is not put to work or is employed for less than two hours, the employer shall pay him for two hours' time, weather permitting work, provided the member remains on the job during the said two hours. On jobs of more than two hours' duration, all members shall be paid for the actual hours worked."

Many contractors and unions have lifted this clause and included it in their own agreements because it is clear and fair.

Union Security

Historically, the building trades unions always have included closed shop clauses in their contracts. These clauses, of course, are prohibited by the Taft-Hartley Act, but even so about 85% of the contracts negotiated for the construction industry contain closed shop provisions.

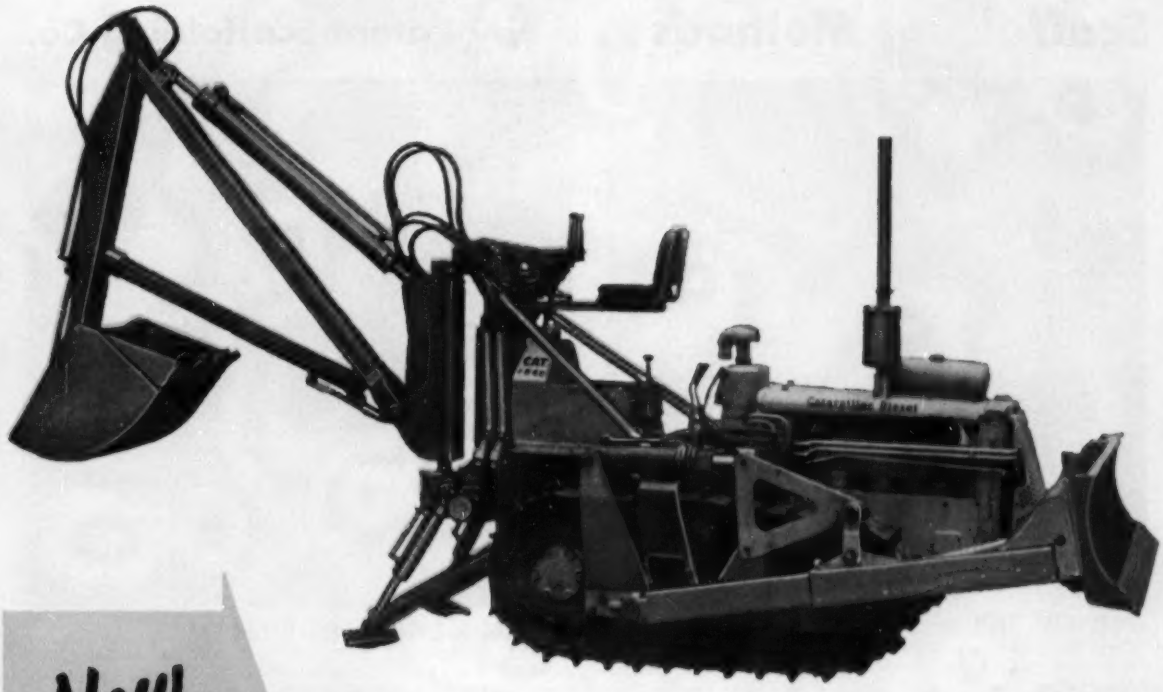
But you must take into account the possibility that you may be hauled before the NLRB on a discriminatory discharge complaint. This may involve heavy legal expenses and other charges.

To avoid this unnecessary trouble and expense, seek during negotiations to have something like the following substituted for the old closed shop provision:

"When the employer employs any person or persons not a member of this union, the employer shall require as a condition of employment of such person or persons, membership in this union on or after the 30th day following the beginning of such employment or the effective day of such agreement, whichever is the later.

"No such person or persons shall be required, with reference to such union membership, to conform to any union rules or regulations not sanctioned by the National Labor Relations Act or any amendment thereto. If said act shall, by amendment, fix a different period within which such non-member shall be required to join such union, such amended period shall be substituted for the thirty day period above referred to."

This clause follows the requirements of the law. If a contractor and a union local are faced with a discriminatory discharge complaint before the NLRB, this clause will not immediately prove the complainant's case, as the old closed shop agreement often does.



New HYDRAULIC D-4 BACKHOE

1/2 yard capacity

A MAJOR ADVANCE IN THE TRACTOR-MOUNTED BACKHOE FIELD

HYSTER — The Only Backhoe Designed *Specifically* for the Caterpillar D-4 Tractor

The new Hyster D-4 Backhoe digs anywhere a track-type tractor can go! Digs down to 13 feet, loads up to 9′ 7½″.

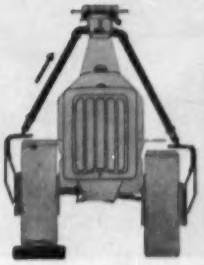
You get these outstanding operating benefits:

3 Dippers Available — giving 13″, 21″ and 29″ cutting width. Equipped with replaceable alloy steel points crimped onto adapters from bottom for easy replacement.

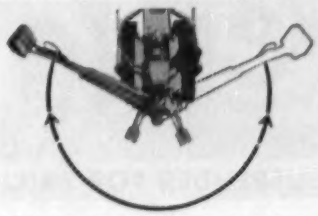
Retractable Hydraulic Outriggers provide full machine stability. Can be raised to allow 17″ clearance in travel.

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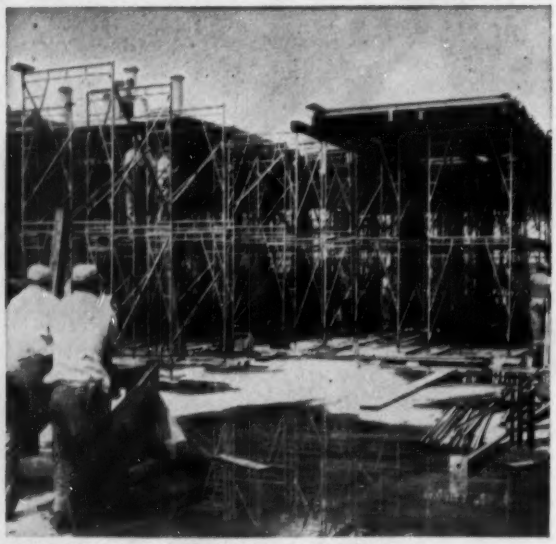
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(Advertisement)

Scaffolding Methods . . . by Patent Scaffolding Co.



END OF THE OLD WORLD—To raze the 13-story Pulitzer building, former home of the old New York World newspaper, more than 3,500 6'6"-high "Trouble Saver"® Sectional Scaffolding frames, spaced 6' apart, were used by Lehigh Salvage Corp. and J. Klotz, Inc. wrecking contractors. Double 8" I-beams, projecting through wall, is the method used to support 89' of the scaffolding adjacent to the busy approach to Brooklyn Bridge.



SLIDING SHORING SYSTEM—Disassembling and reassembling shoring is eliminated by the Wigton-Abbott Corp., Plainfield, N. J., by sliding entire units of the "Trouble Saver" Sectional Shoring on wood sills with a hand winch. Eleven of these shoring units, each covering 720 sq. ft., were slid three times by this method for succeeding concrete pours during construction of the 189' x 231' Monsanto Chemical Co., warehouse, Kearney, N. J.



SUSPENDED FOR BRICK WORK—A 5'-wide working platform is provided for brick masons and materials by "Gold Medal"® Scaffolding Machines while laying up brick veneer on the new 13-story Court House in Tulsa, Okla. Supported by steel I-beams secured to the roof, these suspended machines keep masons at most efficient working level as work advances. Equipped with overhead attachments for planking, the scaffolds also protect workers from falling objects. This scaffolding method was employed by the Manhatten Construction Co., Muskogee, Okla.



FAST LOCK-UP—"Trouble Saver" Scaffolding frames are available for sale or for rental with these fast-acting SlideLoks for joining braces to frames. Wing nuts are eliminated. SlideLoks cut erection and dismantling time and increase safety.

To help you with your scaffolding and concrete shoring methods, PS offers a complete nation-wide engineering service available to you locally. See the Yellow Pages in your 'phone directory for the nearest Patent Scaffolding office or representative that sells and rents "Gold Medal" Scaffolds.

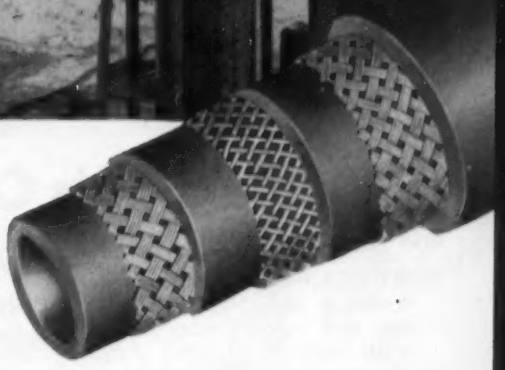
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DOWN TIME...ZERO



Nothing gives hose a worse beating than a pile driver. And here's hose built to take it . . . day in and day out! Thermoid Powerflex Pile Driving Hose has the brute strength that assures longer wear, fewer replacements. *You can forget about down time.* Yet Powerflex is lightweight, flexible, kink-resistant, easy to handle.

No wonder it's tough . . . look how it's made

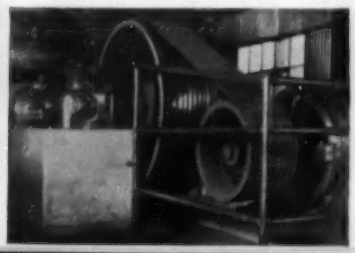
- Heat and oil resistant tube.
- High tensile braided steel wire reinforcement prevents bursting . . . gives flexibility.
- Special pattern of the wire braid develops positive lock of tube and cover to reinforcing structure. Mechanically bonded insulating plies assure homogeneous body structure.
- Internal stress of the hose under pressure is completely absorbed by the wire braids, not the insulating plies.
- Tough, specially compounded cover resists abrasion and aging.

Thermoid Powerflex Pile Driving Hose is only one of many types of Thermoid hose built to give the construction industry longer service and lower operating costs. The Thermoid Distributor in your area carries a complete line of Thermoid Hose, Multi-V Belts and Conveyor Belting, to meet the most exacting needs of every job.

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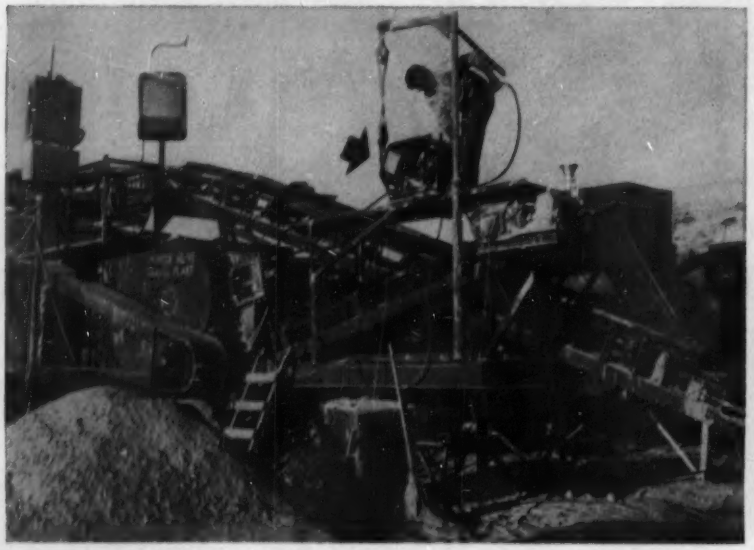


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Thermoid

Thermoid Company, Trenton, N.J.



SWINGING DAVIT lifts Linde portable to permanent platform when crusher rolls need building up. Welding unit is stored in steel box on ground when crusher is working.



SEMI-AUTOMATIC hardfacing and convenient welding equipment cut downtime in half.

Welding Aids Cut Downtime

BY CHANGING from manual electrodes to semi-automatic hardfacing and by equipping the plant with built-in welding facilities, Arizona Sand and Rock Co. is reducing downtime on its 46 VE Pioneer portable gravel plant by more than 50%.

Forced to use the tough blue granite available in the Phoenix, Ariz., area for black top aggregate on an airfield paving job, Arizona Sand & Rock Co. found that for every hour the crusher worked, an equal amount of time was spent to build up worn rollers.

When they changed from manual welding to semi-automatic hardfacing, and built in welding equipment, they were able to cut downtime to seven hours for each 16-hr shift the crusher worked.

Mounted Welder Impractical

Ralph Greer, the equipment superintendent, at first planned to mount a Linde portable semi-automatic welding machine on the crusher in an attempt to save the time necessary for the welder to set up his equipment. This proved impractical, however, because of the crusher's constant vibration and the danger of dust damaging the welding machine.

So Greer decided to locate the welding machine in a steel box on the ground as near as possible to the crusher rolls. There, the welding machine is stored during the day, away from dust and vibration, while the crusher is working.

A permanent platform was erected at a height that would give the welder the easiest access to the rolls, and a swinging davit was rigged up to simplify nightly handling of the machine. When the production shift is over, the welding machine is raised by the swinging davit to the platform. The Linde machine is powered by a generator located in a large power house trailer that is an integral part of the portable crushing plant.

Remote Control Switch

Another time saving idea was a home-made positioner that turns the rolls during the hardfacing operation. A chain and sprocket drive, powered by a fractional hp motor, was mounted on the main drive shaft between the crusher's diesel motor and the rolls. A remote control switch located within easy reach of the welder on the platform lets him start or stop the rolls with a flick of the switch.

During the after-hours welding, the clutch on the main-drive diesel is disengaged to eliminate drag, and during the day, when the crusher is working, the loosely fitted chain from the turning device is slipped from the sprocket.



CHAIN AND SPROCKET device mounted on drive shaft allows welder to position rolls.

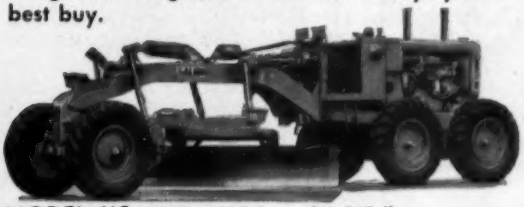
Ralph Lowrance, Arizona's full-time maintenance welder, uses the Linde semi-automatic to build up any low spots on the 40x20-in. rolls with Stoody 7/64-in. dia manganese wire and then to apply Stoody 100 tubular alloy wires to the corrugations. Both rolls are touched up each night.

The Most Complete Line

8 Models GALION MOTOR GRADERS

Most "PUSH-POWER" at the Blade

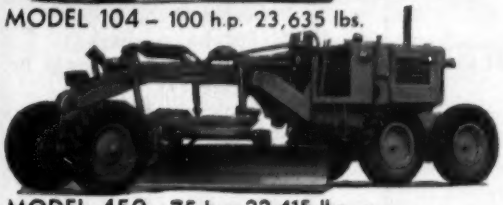
Galion Graders give you correct balance of weight, power, and blade pressures to produce maximum "push-power" at the blade—where power means most in moving more material in quicker cycles with least operator fatigue. Weight for weight, a GALION is always your best buy.



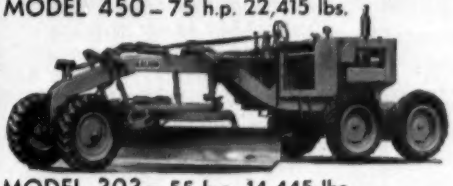
MODEL 118 – 115 or 125 h.p. 24,910 lbs.



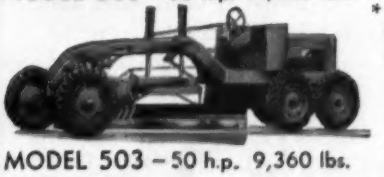
MODEL 104 – 100 h.p. 23,635 lbs.



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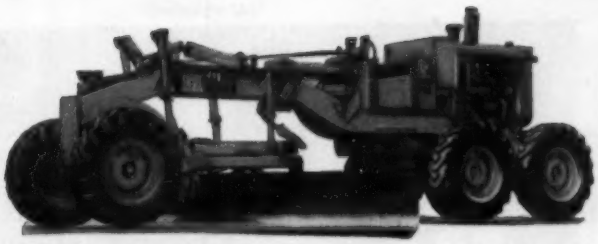


MODEL 303 – 55 h.p. 14,445 lbs.

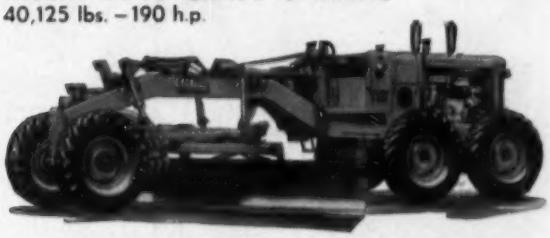


MODEL 503 – 50 h.p. 9,360 lbs.

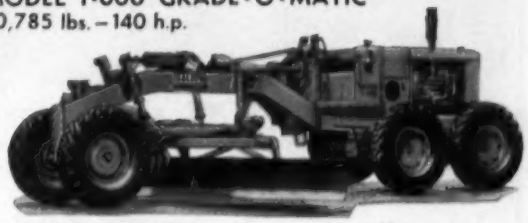
* Galion GRADE-O-MATIC Graders utilize a Torque Converter with tail shaft governor and Power-Shift Transmission



MODEL T-700 GRADE-O-MATIC *
40,125 lbs. – 190 h.p.



MODEL T-600 GRADE-O-MATIC*
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MODEL T-500 GRADE-O-MATIC *
25,000 lbs. – 125 h.p.

IT'S "PUSH-POWER" AT THE BLADE THAT COUNTS!

ESTABLISHED GALION 1907

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☐ Model T-600	☐ Model 104	☐ Model 503
☐ Model T-500	☐ Model 450	

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(Advertisement)



WORKMEN ARE SHOWN vibrating concrete in thin-shell precast roof panels using Viber Model PX pneumatic vibrator mounted on screed.

Contractor Casts 2-Inch Reinforced Roof Panels with Special Screed Using Viber Standard External Vibrator

CONTRACTOR FOR MORE THAN 740 precast, thin-shell roof panels for an earthquake resistant reservoir at the new San Pablo Filter Plant, El Cerrito, Calif., devised an efficient method of vibrating reinforced concrete webs only 2 inches thick.

P. Grassi-American Terrazzo Co., San Francisco, developed a screed on which a Viber standard Model PX pneumatic high speed vibrator was mounted. Thus concrete was screeded and vibrated in one operation.

Precast panels were 24 ft. long by 4 ft. wide with webs 2 in. thick. In addition to being thin in section, webs were reinforced with welded wire fabric making these areas virtually inaccessible to internal vibration. This made external vibration necessary.

Following proper curing, panels were hoisted by crane and placed on girders also precast by the contractor. Dimensional accuracy of precast panels was good, facilitating placement which was done at the rate of 10 panels in less than one hour. Panels were then welded to inserts in girders to make structure solid.

Viber's Model PX concrete vibrator selected by the P. Grassi-American Terrazzo Co. is used widely in pipe yards and tunnel lining operations wherever reusable steel forms are set up for use on a production basis.

For further information on Viber's complete line of internal and external vibrators, contact your authorized distributor or Viber Company, Dept. 8-A, 726 So. Flower Street, Burbank, California.



PRECAST ROOF PANELS shown welded in place were set on girders by truck-crane. Channel side is 8 inches deep and has shelf to retain grout seal.

VIBER

CONCRETE VIBRATORS SINCE 1931

MAINTENANCE SHOP...
Continued

VISUAL INSPECTION may fail to give a true indication of the condition of steering mechanisms. Small cracks indicating impending failure can be overlooked, even with frequent and careful inspections of arms, spindles, and related parts according to Euclid engineers.

For this reason, Euclid now recommends that these parts be magnafluxed every 4,000 hours or once a year. This type of inspection will indicate clearly whether everything is in order or if parts should be replaced to avoid trouble.

While few maintenance shops are equipped to handle magnafluxing, practically every town has a local company that can handle the job quickly and easily. These firms usually are listed in the telephone directory under "Magnetic Inspection."

Following are Euclid's recommendations, designed to prevent dangerous and costly steering system failures:

Every 100 hours check:
- *Steering gear lubrication level*
- *Steering booster pump belt*
- *Tie rod and draglinks (for looseness or bending)*

Every 500 hours check:
- *Ball joints (will probably need adjustment)*
- *Front axle stops and arm stops*
- *Steering gear mounting bolts*

Every 1,000 hours check:
- *Booster relief valve settings*
- *Steering gear (drain and refill)*

Every 2,000 hours check:
- *Steering column alignment*
- *Steering gear cam thrust bearings*

Every 4,000 hours check:
- *Magnaflux Pitman arms, steering arms, spindles, and related parts*

Maintenance Tip:





4-wheel-drive PAYLOADER® gets around!

The quick acceptance and success of the 4-wheel drive tractor-shovel probably has no parallel in construction equipment history. Pioneered and first introduced by Hough in 1948, this type of machine is numbered in the thousands among contractors, pits and quarries, public bodies, mines and industry.

Hough leadership and pioneering in the 4-wheel drive field continues and is presently represented by three new "PAYLOADER" sizes — all incorporating the "know-how" and new features that result in better performance — more production, easier and faster — at lower net cost.

All three have powerful pry-out action and 40 degree bucket tip-back at ground level to dig faster, get bigger loads and carry bigger loads — safely. All three have more powerful engines — a choice of gasoline or diesel — and many other more-yardage features.

Your "PAYLOADER" Distributor is eager to show what these new units can do — for you.

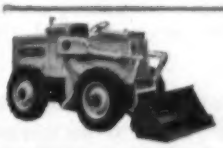
a choice of 3 new sizes



MODEL HO
2 cu. yd.



MODEL HH
1½ cu. yd.



MODEL HU
1 cu. yd.

THE FRANK G. HOUGH CO.
706 Sunnyside Ave., Libertyville, Ill.

Send full data on new 4-wheel drive "PAYLOADER" tractor-shovels.

☐ Model HO ☐ Model HH ☐ Model HU

Name .....

Title .....

Company .....

Street .....

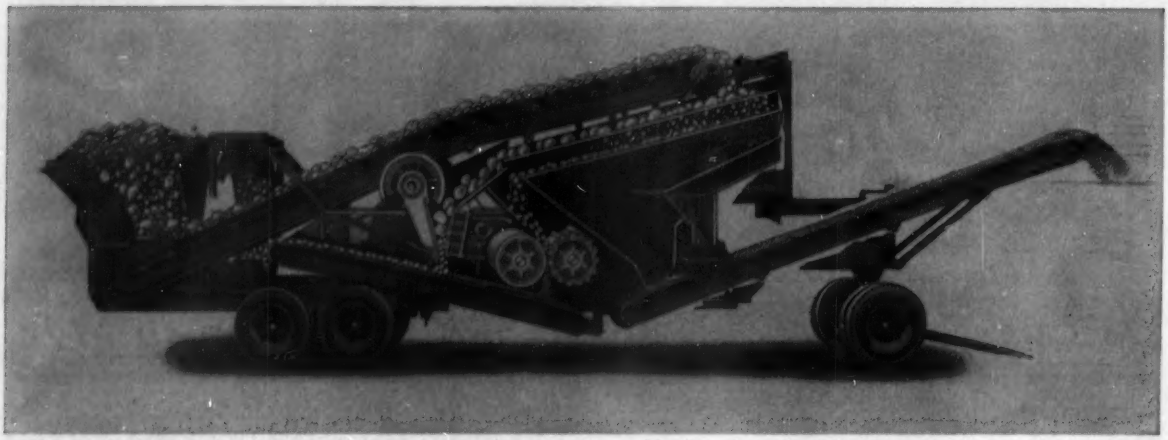
City .....

State .....

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

YOU NAME THE JOB

there's a UNIVERSAL CRUSHING PLANT ready to make shorter work of it



Universal 880 Gravelmasters—complete, compact crushing, screening and loading plants. Available in a range of sizes with reported capacities of 75 to 400 tons per hour.

What kind of output capacity do you need to operate at the best margin of profit? Big capacity? All you can get? Universal jaw crushers are available in sizes up to 42" x 48"; roll crushers up to 54" x 24"; impact breakers up to 57" x 60". And you can get Universal screening, loading and washing equipment in all sizes, too, to give you the right combination for profitable operation.

Need big capacity in a portable plant?

The Universal 880 Super Senior Gravelmaster comes with 40" x 24" rolls; 10" x 36" jaws . . . with plenty of screening and conveyor capacity to take care of the huge crusher output.

Is this more capacity than you need?

Perhaps the Universal 880 Junior "B" fits your requirements best. The 880 Gravelmasters come in a wide range of sizes. Any one of them can be used as a complete gravel crushing, screening and loading plant. Or, as a "secondary" in combination with Universal 546P primary units ranging in jaw size from 15" x 24" to 30" x 42".

Tell us your job requirements—write to the address below or consult your distributor. You'll get a carefully considered recommendation fitted to your needs.

MODEL	Junior "B"	Junior	Senior "R"	Super Senior
Jaw Crusher	10"x16"	10"x24" 10"x36"	10"x36"	10"x36"
Roll Crusher	18"x16"	24½"x16"	30"x26"	40"x24"
Gyrating Screen	2'x8' 2½	3'x10' 2½	4'x12' 2½	5'x12' 2½
Plate Feeder	19"	19"	25"	25"
Weight	28,600#	44,500#	54,000#	59,600#
CONVEYORS				
Under Conveyor	18"x10'	24"x14'	30"x18'	30"x19'
Feed Conveyor	20"x23'	24"x26'	30"x29'	36"x34'
Delivery Conveyor	24"x18'	24"x20'	30"x21'	30"x24'
	Front Discharge Folding	Front Discharge Folding	Front Discharge Folding	Front Discharge Folding

PETTIBONE
UNIVERSAL
In Cedar Rapids, Iowa since 1906

UNIVERSAL ENGINEERING CORP.
327 8th St. N.W., Cedar Rapids, Iowa

A Subsidiary of Pettibone Mulliken Corporation, 4700 W. Division St., Chicago 51, Illinois

After the Great Ford Foundation Gift...

What Still Remains To Be Done To Provide Decent Faculty Pay

The Ford Foundation's gift of a half billion dollars to our privately supported colleges, medical schools and hospitals, now being distributed, is magnificent. But it will be much more magnificent if it inspires completion of the job to which it gives a lift. So far as the colleges and universities are concerned, this job is primarily to rescue their faculty members from being second-class citizens economically.

Even in a period when we have become accustomed to astronomical financial figures, a half billion dollars remains an eye-popping gift. In fact, it is so imposing that a good many people who don't read the fine print are apt to conclude that it must just about solve the financial problem to which it is addressed.

Goes Only a Small Way

However, we have allowed college professors to fall so far behind the parade financially that the share of the Ford half billion dollar gift going directly to the improvement of faculty salaries ($210 million) will go only a small way financially toward doing what is necessary to provide adequate salaries.

Completion of this job for our privately supported colleges and universities calls for:

1. An increase in faculty salaries at least five times as great as that made possible by the Ford gift merely to restore salaries to their 1939 purchasing power level and an increase fifteen times as great to provide adequate salaries today.

2. Some difficult and courageous decisions by the heads of the colleges and universities in apportioning the grants received by them.

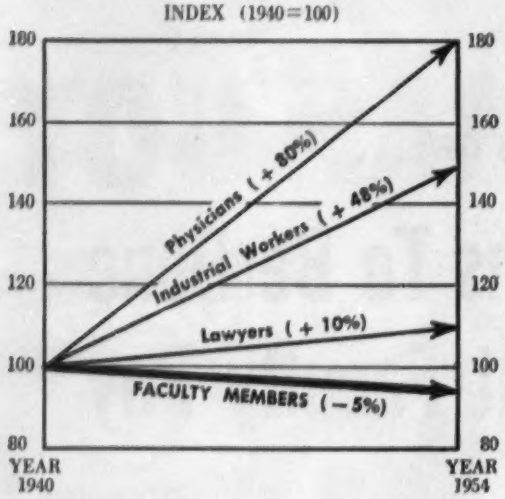
Terms of Gifts to Colleges

The $210 million of the Ford Foundation gift going specifically to improve faculty salaries is being distributed on the following basis: Each of 615 privately supported, regionally accredited liberal arts and science colleges and universities receives a gift about equivalent to its last year's teaching payroll. For ten years only the income from these gifts is to be devoted to raising faculty salaries. After that all the money can be spent in any way the institutions receiving it see fit. There is no requirement that universities having other than liberal arts and science schools limit use of the gifts to improving salaries in these schools alone. They can spread it right through all their faculties if they wish.

In addition to the gift of $210 million specifically directed to increasing faculty salaries, another gift of $50 million goes to a group of 126 institutions selected for specially noteworthy leadership in improving

continued on next page

What's Happened to College Faculty Salaries*



* Real Income before Taxes.

Source: Council for Financial Aid to Education, U. S. Dep't of Commerce; U. S. Dep't of Labor.

the status and pay of teachers. For these schools the individual gifts add about 50% more to the amounts coming from the $210 million fund. They can be used to improve faculty salaries if the institutions choose to do so, but this is not required by the terms of these gifts.

The $210 million plus the $50 million should yield an income of $10-$13 million a year. Even if all this is used to raise salaries, it will be only a small step, however worthy, toward the $200 million per year the colleges need to meet their salary requirements adequately.

Helps Some Who Need It Most

In focussing its gift to improve faculty salaries in privately supported liberal arts and science colleges, the Ford Foundation aims at least part of the help at the spot where it is most desperately needed. Numerous surveys have indicated that the most poorly paid of all college and university faculty members are those in small, privately endowed liberal arts colleges.

But the overshadowing fact is that the teachers in our colleges and universities as a whole are badly underpaid. Just how badly is indicated by the chart above which first appeared in an earlier editorial. (Figures later than those for 1954 are not available.)

The Ford gift will turn the indicator of faculty salaries, which now lies far below the general salary trend, upward a few points. And it will do this in some places where salaries are below the wretched average shown by the chart.

But the Crucial Test Remains

College and university administrators will have the opportunity to extend further the process of getting the help provided by the Ford Foundation gifts where it is most needed. In general, this will mean giving it to senior faculty members, in order to hold experienced teachers and make college teaching attractive as a career. But to make such a division in many schools will take extraordinary fortitude.

The crucial test of the success of the enterprise of the Ford Foundation in raising faculty salaries will lie in whether it prompts the rest of us — college alumni, individuals, business firms and legislators alike — to see that it is a great beginning, not a signal for a recess.

Even with the Ford gifts providing $10-13 million a year, our privately supported colleges and universities must have an increase of about $190 million a year to provide decent faculty salaries.

This is a job far beyond the capacity of the Ford Foundation, imposing though that is. It is a job far beyond the capacities of a few hundred large corporations and a few thousand wealthy individuals. If it is to be done, it is a job at which all of us must work with a will.

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nationwide developments that are of particular concern to the business and professional community served by our industrial and technical publications.

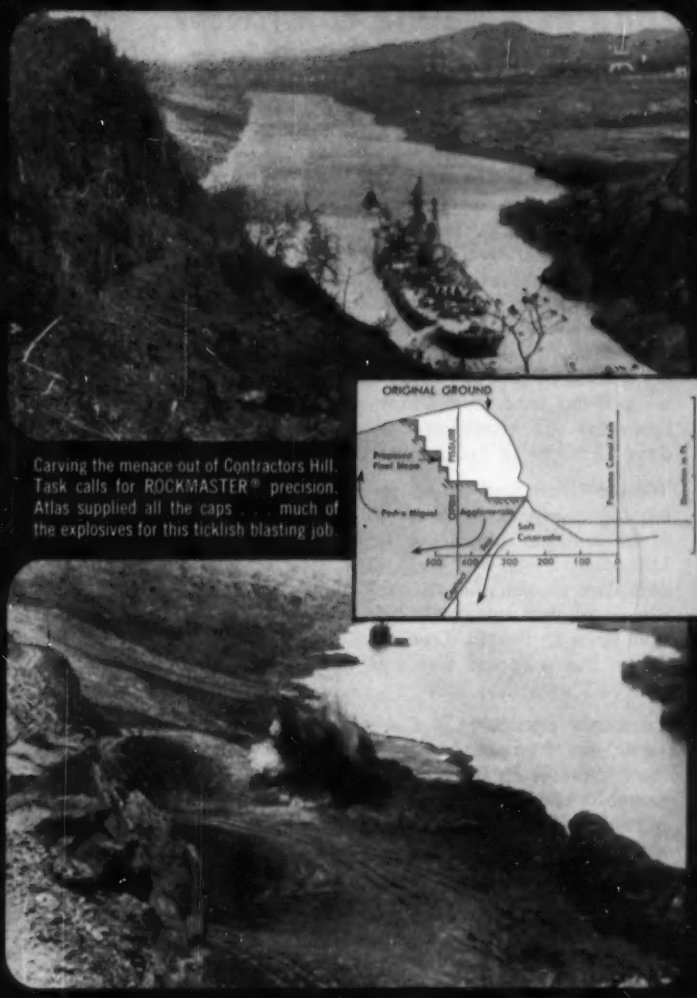
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Donald C. McGraw

PRESIDENT

McGRAW-HILL PUBLISHING COMPANY, INC.

Engineered Blasting keeps 'Contractors Hill' from toppling into Panama Canal



Carving the menace out of Contractors Hill. Task calls for ROCKMASTER® precision. Atlas supplied all the caps . . . much of the explosives for this ticklish blasting job.

Since 1938, a menacing fissure has been slowly widening in Contractors Hill, 330 feet above the Panama Canal. Last year, Tecon Corp., Dallas, Texas, undertook the challenging job of carving 4,500,000 tons of treacherous, highly fractured rock from the face. The problem was to blast . . . but without toppling the mountain, and with little except dust falling into the Canal itself!

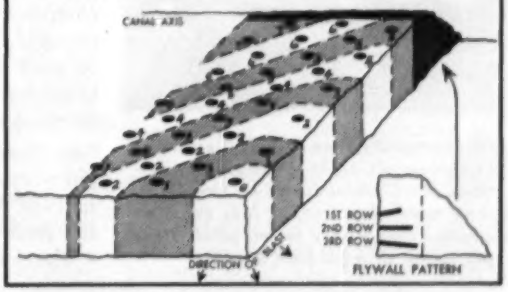
Using ROCKMASTER® millisecond delay electric blasting caps, the contractor carefully selects timing patterns. A bench is made by blasting vertical holes up to within 20 feet of the face. Horizontal hole blasting breaks the remaining 20 feet in place.

Vertical hole blasts are bottom-initiated—ROCKMASTER caps being chosen to move the base of the face out first, and direct throw away from the Canal. Triple rows of horizontal holes are timed to fire: top, bottom, middle. This sequence creates a fracture line in the last 20 feet, decreases backbreak, and assures breakage *in place*. Thus, broken rock can't pitch forward into the Canal.

On tough blasting jobs like this, the "custom-tailored" ROCKMASTER method can't be beat for extreme flexibility and control. Let your Atlas representative show you how ROCKMASTER can go to work for you.

BLAST PATTERNS

TYPICAL PATTERN USING ROCKMASTER® MILLISECOND DELAY ELECTRIC BLASTING CAPS



ATLAS

ATLAS EXPLOSIVES

"Everything for Blasting"

ATLAS POWDER COMPANY
WILMINGTON 99, DELAWARE

Offices in Principal Cities

Utilities pipeline contractor

Averages 20 feet of trench per minute, digs 2 to 4 jobs per day with each of his Clevelands

1000 feet of complete pipeline construction—trench digging, pipelaying, backfilling and backfill compaction—is an average day's work for each crew of F. H. Linneman, Inc., pipeline and utilities contractor of Denver. Most of this work is on 2-, 4- and 6-inch pipelines for the many new housing developments in the Denver area.

With a Cleveland Trencher opening up trench at an average rate of 20 feet per minute, a typical Linneman crew will do 2, 3 or 4 complete pipeline jobs in an 8-hour day—jobs that run from 50 to 1000 feet each in length. One of these crews has a record day's production of 7 complete jobs.

Currently operating 7 Cleveland Trenchers, Linneman specializes in utilities work—gas, water and sewer line construction. Equipment-minded and especially maintenance-conscious, he has consistently employed Clevelands ever since he began his contracting business in 1946.





Fast portability of equipment is essential in Linneman's tight-scheduled operations. His Clevelands can be loaded on their low-bed trailers in less than 10 minutes time, ready to roll safely from job to job at legal limit speeds.

"Maintenance costs on Clevelands are appreciably lower" says owner of 7

Here is what F. H. Linneman has to say about trenchers:

"In the type of work we most generally perform, in the city especially, we have found Clevelands best suited to our operations because of their narrow-width construction, compactness and speed. They enable us to work in close places and keep trenching ahead of follow-up operations, a decided advantage.

"We have employed Clevelands in our work since we began contracting in 1946. We have seven of them at the present time, the oldest being a Cleveland Model 95 purchased in 1948. We have no record of the miles this machine has dug, but feel that it would be a near-record. Our maintenance costs on it have been extremely low.

"Our over-all maintenance costs on Clevelands are appreciably lower than on other trenchers we have operated. This is another reason why we have purchased more Clevelands than any other make. We have also found it easier to train operators for Clevelands than for any other make. Our newest Cleveland, a "240," was delivered only last week by H. W. Moore Equipment Co., here in Denver."

THE CLEVELAND TRENCHER COMPANY • 20100 St. Clair Ave. Cleveland 17, Ohio

CLEVELAND

Construction Men in the News . . .





ARBA Names L.W. Prentiss Executive V.P.

MAJ. GEN. LOUIS W. PRENTISS (left), retiring Commanding General of the Engineer Center, Ft. Belvoir, Va., will succeed **LT. GEN. EUGENE REYBOLD** (right) World War II chief of Army Engineers, as executive vice-president of the American Road Builders' Association.

Gen. Prentiss, 56, will retire officially April 30 after 35 years of military service and will assume his new office on May 1.

A native of the District of Columbia, Gen. Prentiss is a graduate of the Colorado School of Mines, entered the Army's Field Artillery in 1921 and soon after transferred to the Corps of Engineers. In December, 1952, President Truman appointed him Engineer-Commissioner of the District of Columbia in which post he served until 1954. He was promoted to major-general in 1954 and given command of the Engineer Center.

Gen. Reybold, 71, has served as executive vice-president of ARBA since 1950. He is a native of Delaware and a graduate of Delaware College. He served throughout World War II as chief of the Corps of Engineers and retired from active duty in January, 1946.

"Beavers" Present Their First Awards



WILLIAM A. JOHNSON, first president of the "Beavers," newly formed West Coast counter-part of the "Moles," presented Beaver awards to 16 outstanding western heavy construction men at an award dinner in San Francisco. Recipients were:

In Management

GUY F. ATKINSON, president, Guy F. Atkinson Co., South San Francisco, Calif. Atkinson's company has been active in some of the best known projects of the century which include Hansen Dam, Los Angeles County; Harlem Dam, Nebraska; Pine Flat Dam, California; and the Ross Powerhouse and Rock Island Dams. Atkinson was national president of Associated General Contractors of America in 1939.

HERMAN BROWN started modestly in the construction field in 1914 with two teams of mules and some worn-out, mortgaged equipment paid him in lieu of cash by a former employer. With his brother, George, Brown parlayed this modest start into the Brown & Root, Inc., of Houston, Texas. Present activities of the firm include a dam in Haiti, another in Pakistan, airfields in Spain, and chemical plants in Canada and in Italy.

HENRY J. KAISER entered the construction field in 1911 and established his own firm, three years later at the age of 32. Within a few years he was engaged in millions of dollars worth of highway construction in Washington, Idaho, British Columbia, California, and Cuba. He now has interests in 20 different industries with 116 factories producing 290 products representing more than $1 billion worth of goods annually. His construction company is Kaiser Engineers, a division of Henry J. Kaiser Co. of which he is chairman of the board.

HARRY W. MORRISON is co-founder and Board Chairman of Morrison - Knudsen Co., Inc. He began his career in 1904 as a timekeeper on the Minidoka Dam and Powerhouse, Idaho, then worked as axeman, chairman, rodman, levelman, foreman, draftsman, and superintendent. With M-K, Morrison has built everything from giant dams to vast airbases.

In Supervision

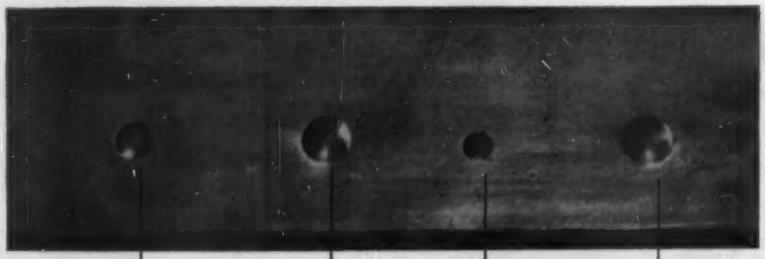
LEE T. GRIDER, with 57 years in construction, started as a concrete laborer on bridge and ditch work in southern California and rose quickly to project manager for some of the nation's top heavy construction contracts, including dams, airbases, tunnels, reservoirs, and approximately 40 oil storage reservoirs.

B. (WOODY) WILLIAMS joined Morrison-Knudsen Co. in 1926 as labor foreman during construction of Guernsy Dam in Wyoming and worked with the late FRANK T. CROWE, on Hoover and Shasta Dams. Williams has played an important role in the building of a large number of the world's most massive structures (CM&E, Jan. 1956, p 157).

HARVEY SLOCUM adds the Beaver citation to his recent Mole award (CM&E, Nov. 1955, p. 163). Starting in the construction industry at the age of 12 (driving nails into pilings to prevent teredo destruction), Slocum has supervised and cost estimated dams which include Grand Coulee, Hoover, Bryant, Shasta, Bull Shoals, Pine Flat, and others.

C. W. (SMOKY) WOOD joined General Construction Co. as an en-

(Continued on next page)



BRAND A BRAND B BRAND C

MARKS OF A KILLER!

BULLARD



Can you read the marks of potentially killing blows from a five pound ball dropped 8 feet on the crowns of aluminum safety hats? The depth of the dents on this aluminum bar indicates how much actual impact the wearer would feel on his head. See how deeply blows on competitive hats A, B and C mark the metal. Yet, the BULLARD aluminum hat hardly shows a mark. This is because BULLARD'S exclusive full floating headband distributes and absorbs the blow, taking the danger out of the impact. This, coupled with the girder-like strength of the BULLARD three-ribbed crown provides the greatest protection possible in aluminum hats and caps. **COMFORT**—They are just as light as your old felt hat. The cap weighs only 10 ounces. And with BULLARD'S exclusive universal headband you're always assured of a perfect fit. **COLOR**—Now you can have a choice of permanent non-fading colors in aluminum hats—yellow-gold, blue, grey, green, bronze and silver. Colors to identify trade or company.



BULLARD

E. D. BULLARD COMPANY, 275 Eighth Street, San Francisco, California

CONSTRUCTION MEN...

Continued from page 165

gineer in 1928, becoming vice-president in 1946 and a director in 1947. Wood has superintended such projects as Owyhee Dam, the Oakland Bay Ridge piers, Bonneville Power House and Navigation Locks, Hetch Hetchy Dam, Ross Dam, and Paine Field Airbases.

Eight other awards were made for engineering and supply.

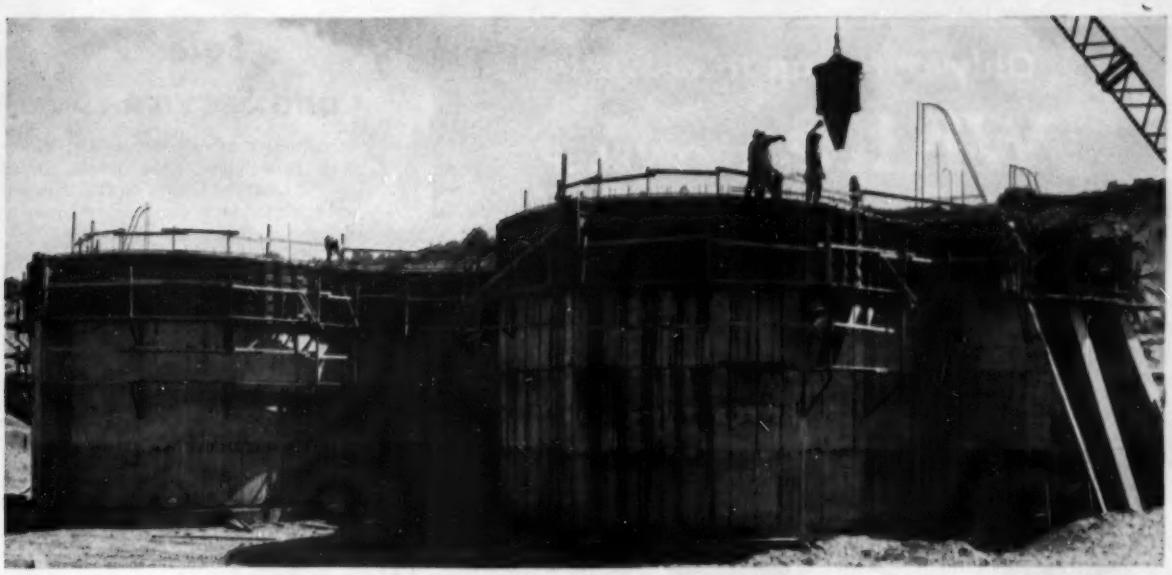


GERARD T. SHANNON has been elected vice-president of Walter Kidde Engineers Southwest, Inc., a division of Walter Kidde Constructors, Inc., New York and Houston builders and engineers. He was General Manager of the southwest office of Walter Kidde Constructors.

Shannon joined Kidde in 1953 as managing engineer for the company's industrial engineering department. He was previously assistant director, Engineering and Construction Division, U.S. Atomic Energy Commission, New York Operations Office. Shannon will continue as general manager of the southwest office.

M. C. HARRISON, president, Harrison Construction Co. of Pittsburgh, Pa. has been given an American Standards Association Award for ". . . leadership in advancing the development and use of voluntary standards as instruments of free enterprise."

GEORGE A. DENT has joined the firm of Benjamin E. Beaven Company, Baltimore firm of consulting engineers. Dent, assistant chief of the Asphalt Institute at College Park, Md., and president of the Asphalt Paving Technologists, introduced the first mobile soils laboratory in construction as materials engineer with the Maryland State Roads Commission.



STORAGE WALLS to hold sand and gravel, designed and engineered by Kaiser Engineering Co. Symons Pre-Fab Fir Plywood Forms were called upon for the work because they could be prefabricated to fit the need and on the basis of savings in time and money. Butler Construction & Engineering Co., Seattle, Washington, is the contractor.

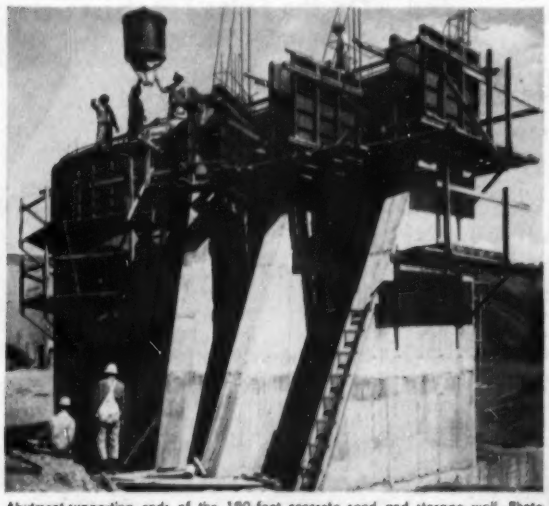
COST SAVINGS SELL SYMONS FIR PLYWOOD FORMS FOR 40 FT. HIGH "S" CURVED CONCRETE STORAGE WALLS

An unusual concrete construction job in Steilacoom City, Washington, involved the erection of two sharply curving free-standing concrete walls 40 feet high and 15 inches thick. The curves are shaped to a radius of 15 feet 6 inches. One wall is 190 feet long and the other is 400 feet long. They face each other across a space of 200 feet.

The curving surface of the walls posed a serious problem in forming. This was solved by the use of Symons Pre-Fab Fir Plywood Forms.

Most of the form panels were 2 x 6 feet with ¾ inch exterior *Plyform* faces framed on the edges with 2 x 4's and reinforced with steel cross members spaced 12 inches O.C. The job also required a number of filler panels 20 inches by 6 feet in which the plywood facing on each side extended past the framing 1¼ inches, making it possible for the edges of the form to butt closely on the outside surface of the curves.

Symons Engineering and Customer Service also play an important role in projects where forming is a serious problem. The Symons Engineering Staff will furnish complete form layouts and job cost sheets on the form work—at no charge to the contractor. This service enables the contractor to get a clear picture of his job (its cost, bill of materials and labor saving methods). Symons fieldmen give regular on-the-job service. First, by on-the-job recommendations of forms and hardware needed. Second, by showing the workmen how to set up the forms efficiently. Third, by making special deliveries when last minute problems arise.



Abutment supporting ends of the 190-foot concrete sand and storage wall. Photo shows Symons Fir Plywood Forms being used for fourth pour on 40-foot high installation.

Symons Forming System includes just 3 pieces. TWO WAY FORM TIE which holds form securely to the required wall thickness without washers, spreaders or walers. Tie-ends are broken back within wall by a half-twist after forms are removed. TIGHTENING WEDGE is inserted through the slot in the connecting bolt and pulls form sides tightly together. CONNECTING BOLT which is slotted passes through edges of adjacent forms and tie loop.

JUST 3 PIECES



The Symons Forms are available on a Rental-Purchase Plan which offers contractors the opportunity to use the Symons Forming System on a rental basis . . . with all rental charges to apply on the purchase price, during a 60-day period.

Contractors throughout the country have tried this plan and like it. Send in your request for the complete facts—no charge or obligation.

SYMONS CLAMP & MFG. CO.
4255 Diversey Ave., Chicago 3, Ill. Dept. B-6

Please send catalog and information regarding:

☐ Forms ☐ Shores ☐ Column Clamps

Name_____

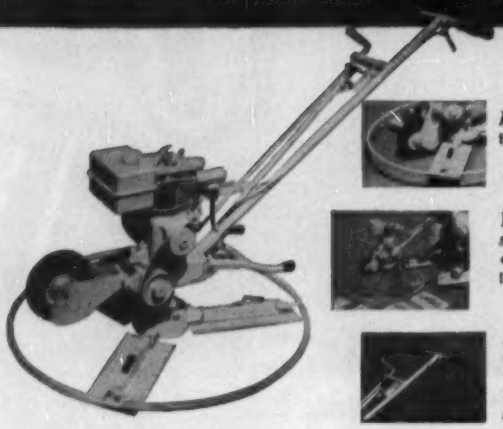
Firm Name_____

Address_____

City_____ Zone___ State_____

Only one man to move a

White TROWELER



Retractable wheel, up to trowel, down to move.

Remove blades and ring in *seconds* . . . for cleaning, changing blades, or moving through doorways.

Adjust blade pitch *during* rotation from handle. Safety throttle control stops rotation if operator lets go handle.

PORTABILITY, patented, exclusive! PERFORMANCE, unbeatable! PRICE, comparable to trowelers *without* these features! Model T-1, 36" diameter, Patent No. 2,621,568.

White MANUFACTURING COMPANY

ELKHART 6, INDIANA

HARBORMASTER

Outboard Propulsion and Steering Units

your complete marine power package



- Easily installed
- Exceptional maneuverability
- Shallow water protection
- Propeller thrust steering in any direction
- Economical operation and maintenance

Sizes available from 20 to 300 h.p., gas or diesel power. Model 0-41H, 50 h.p. illustrated.

Harbormaster Outboard Propulsion and Steering Units are complete marine power packages, *ready for immediate use. Everything is included* . . . fuel tank, battery, steering mechanism, even the hold-down bolts. Mount; put in fuel; start; and you're off with exceptional power and maneuverability. Harbormasters give you special features not found with ordinary marine power. They are the outstanding and practical choice for jobs where you want an easily installed marine power unit you can depend on.

Hundreds of Harbormasters are in use in many marine applications. Send for Catalog.

MURRAY & TREGURTHA, Inc.

40 Hancock St., Quincy 71, Massachusetts

Sales and Service . . .

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distributors, sales personnel and other activities.

Distributor Appointments

Clark Equipment Co.: J. W. Burress, Winston-Salem, N. C., has been appointed distributor for the Michigan line of tractor shovels and excavator cranes for the state of North Carolina. Sheehan-Bartling, Inc., Sioux Falls, S. D., has been appointed to sell and service the Michigan line in South Dakota.

Hough Co.: Two new distributors and the assignment of additional territory to others have been announced by the Frank G. Hough Co. Phillippi Equipment Co., Minneapolis, will handle the entire Payloader line in Minnesota; Rush Equipment Co., Cleveland, now serves all of Ohio; J. D. Evans Equipment Co., Sioux Falls, has the entire state of South Dakota; Brandeis Machinery & Supply Corp. has been given new territory in Southern Illinois; State Equipment Co., Montpelier, has been given the state of Vermont; and Orton Equipment Co. is a new Hough distributor at Stratford, Calif.

Baldwin-Lima-Hamilton Corp.: The Equipment Div. has announced the appointment of Krider Equipment Co., Fargo, N. D., as distributor for Lima shovels, cranes, draglines, and pull shovels. The distributor will cover the entire state of North Dakota as well as three bordering Minnesota counties.

On the Sales Front

LeRoi Div., Westinghouse Air Brake Co.: William F. Briney has been named manager of construction industry sales, according to Jack E. Heuser, general sales manager. Brinley, who joined the organization in 1949, is now responsible for sales of portable air compressors, Tractairs, rock drills, and other products used in construction.

Hyster Co.: Harold R. Lucas has been promoted to manager of the new merchandise division of the general sales department. Lucas has been administrative assistant in the general sales department for six years. Hyster's sales are handled through an international network of over 700 dealer stores.

Hyster Co.: Walter A. St. Clair has been promoted to assistant sales

(Continued on page 172)



Electric power-steer takes "B" quickly down narrow, crooked haul road from a borrow pit. Tournapull's top speed is 28 mph.

Cramped quarters

no obstacle to Big "B's" on US 30S



Here big "B" is push-loaded by 148 hp crawler-tractor. Unit carried 102 loads in one 10-hour day over varying haul lengths.



Spreads are fast and even. Operator gets instant action with simple electric controls.

Narrow haul roads, sharp turns, rough shoulders, were a problem all along 13½ miles of road-widening east of Lima, Ohio. Working for Shelley & Sands, Boso & Ritchie of Ravenswood, West Virginia, assigned this 168,000 yards of dirt-moving to their two B Tournapulls. "B's" job was to widen and fill the old roadway. Fill was hauled from narrow side borrows along the road.

Make 1340′ round trip in 3.3 min.

Each 28 mph "B", push-loaded by a 148 hp crawler-tractor, averaged 14 to 18 pay yards in 38 to 39 seconds over an 85′ to 100′ load distance. Rigs traveled over rough 540′ haul, made 150′ spread in a little over 16 seconds, and returned 550′. They averaged the 1340′ round trip in 3.3 minutes.

Electric controls paid off in fast loading, fast travel time, accurate spreading. Ten speed transmission enabled operators to regulate travel speed to haul road conditions, and always match loading speed with speed of crawler pusher.

Turn in space 35′ wide

Another handy "B" advantage was ability to turn around in a space only 35′ wide . . . 5½′ less than its 40′6″ overall length. Positive geared steer on kingpin, and 30° oscillating pivot, also provided faster maneuverability in all the tight spots.

Check "B's" for big output

For big production dirtmovers, investigate B Tournapulls. Check the B Tournapull Bulletin and your own files for direct competitive comparison. See exactly how and why you get greater output at lowest-net-cost-per-yard. Whatever the size of your job, big or small, there's a Tournapull to do your work: the 7-yard, 138 hp "D", the 16-yard, 208 hp "C", or the BIG 23-yard, 293 hp "B" described here. Ask your LeTourneau-Westinghouse Distributor for a demonstration.



On narrow road, "B" turns easily in 35′.. less than its 40′6″ overall length.

Tournapull—Trademark Reg. U.S. Pat. Off. BP-867-H-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

For Your Next Construction Job



Threaded Rods

Bethlehem Threaded Rods can be supplied with cut threads or rolled threads. Cut-thread rods come plain or upset, in thread diameters up to and including 4½ in., and in all lengths. Rolled-thread rods also come in varied lengths, and in thread diameters up to and including 1½ in.

Bethlehem Threaded Rods can be supplied with turnbuckles, clevises, nuts or other accessories. They come straight or bent, in single or multiple units, asphaltum-dipped or hot-dip galvanized.



Machine Bolts

Furnished in many standard grades of carbon or alloy steel, though usually made to ASTM Specification A-307. They come in a wide size range, with square, hexagon, tee, button and countersunk heads, and with cut or rolled threads of various types. The standard thread is American Standard Coarse, Class 2 fit.



Safety Timber Bolt

Sharp lugs under the head dig into the wood, preventing the bolt from turning when tightened. Underside of head also has spiral ribs, which retard water seepage. When installed, the head lies close to the work. There is no protruding wrench square to cause injury.

In addition to the fasteners shown here, Bethlehem also turns out many other fastener items in a wide range of types and sizes, making it easy for you to get exactly what you need. For full information, just get in touch with the nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL





D Tournapull Rear-Dump's ability to turn around in only 24'8" enables it to spot fast in tight quarters. With 10 to 11 passes of ¾-yard shovel, unit loads 8 pay yards in about 3 minutes. Big 10'11" x 5'10½" bowl opening, with low rear entry, makes loading easy.

Hauling from pit to crusher, "D's" average 900' distance in 1½ minutes... returning in about 55 seconds. Units' 4-wheel multiple-disc air-brakes assure positive control at all times... give operators complete confidence on winding roads and steep grades.



"Better than trucks where going is tough"

says Superintendent R. E. Merritt of Oregon's Jackson County

To speed delivery of rock from quarry to crusher, Jackson County Highway Dept. teamed up 2 D Rear-Dumps to handle all crusher requirements.

On the job the "D's" encountered tight loading quarters, rough quarry terrain and underfooting, and adverse grades on haul roads. Unit's speed and maneuverability, plus ease in spotting in restricted places, helped keep crusher well supplied with rock at all times.

1800' cycle in 9¾ minutes

When pictures were taken, the 11-ton "D's" had already moved 28,000 yards of rock to the crusher. Time studies showed that each "D" was averaging 8 pay yds. per load... 1800' cycles were completed in about 9¾ minutes, including 3.65 min. to load and a 3.95 minute waiting time.

"Work in closer quarters"

Comparing the operation of the Rear-Dumps to trucks, Supt. Ralph E. Merritt said, "The D Rear-Dumps are a lot better than trucks where the going is tough." Operator Floyd Sherman added, "'D's' can get around in a lot closer quarters, too."

Safer than trucks

Besides being faster and more maneuverable than ordinary trucks on rough roads, D Rear-Dumps are also safer when dumping loads. Front-wheel-drive on "D's" keeps power and traction on solid footing well ahead of rear wheels. Because body does not need to clear frame, springs, axle, or differential, its center of gravity stays low, even during dumping. Over-size multi-disc air brakes — with more braking surface on one wheel than comparable-size trucks have on all four — prevent creeping or rolling, especially when dumping.

If you have a tough hauling job... better check D Rear-Dump's advantages for yourself. See how the 11-ton "D", 22-ton "C" or new 35-ton "B" can help you.

Tournapull—Trademark Reg. U.S. Pat. Off. DR-903-P-b



At crusher, "D" dumps 8-pay-yard load in 20 seconds. Operator Floyd Sherman said, "You can get around in a lot closer quarters with 'D's' than you can with a truck." He added, "These D Rear-Dumps are not as hard on the operator as many other types of haulers."

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

NEW *Ramset*®

DUO-JOBMASTER



gives you

TWO TOOLS IN ONE!

RAMSET'S new tool has interchangeable barrels, to set either ¼" or ⅜" fasteners into steel or concrete—an added convenience to the time, temper and money-saving advantages of RAMSET FASTENING SYSTEM.

Will do all of your fastening jobs

Operator carries the second barrel in his pocket like a fountain pen, ready to set any variety of fasteners the job may require—light, medium or heavy duty anchoring into hard materials like concrete or steel.

Makes tough jobs easy

No more drilling or chipping; fasteners are set instantly, accurately and permanently with a press of the trigger.

Learn about this low-cost, time-saving, modern way to fasten. Find for yourself what it can mean to any construction job. A demonstration will convince you.

Ramset Fastening System

WINCHESTER-WESTERN DIVISION

OLIN MATHIESON CHEMICAL CORPORATION

FIRST IN POWDER-ACTUATED FASTENING

12103B BEREA ROAD • CLEVELAND 11, OHIO

SALES AND SERVICE . . .

Continued from page 168

manager of Hyster's eastern industrial truck division, according to R. F. Moody, eastern division sales manager. He was formerly district manager for the Mid-Central district.

Marion Power Shovel Co.: A strengthened organization has been established to handle sales in California, Nevada, Utah, and Arizona. Working under Dean Calland, appointed Western sales manager, are T. R. Fogelberg at Los Angeles, and E. J. Riggs at Phoenix, Ariz.

Thew Shovel Co.: The appointment of Don L. Douglass to the newly created position of parts sales manager has been announced. Mr. Douglass is a member of the Power Crane and Shovel Assn. and a director for the National Sales Executives Club. He was formerly vice-president in charge of distribution for Wayne cranes, manufactured by American Steel Dredge Co.

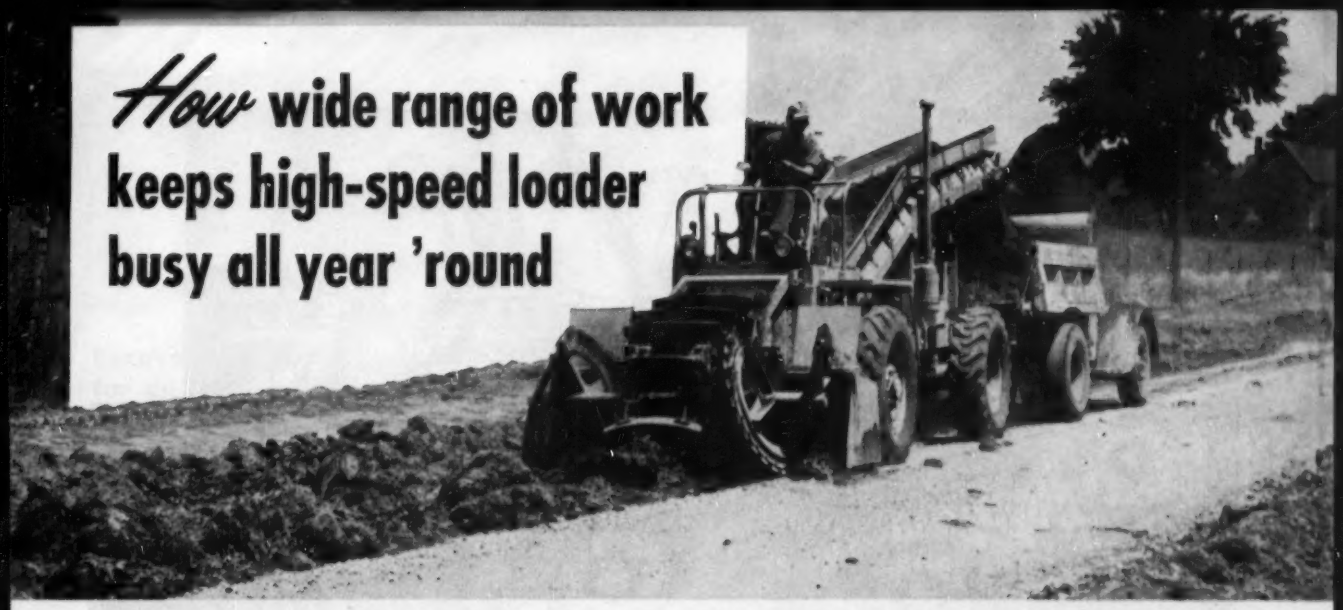
In the Main Office

Allis-Chalmers Manufacturing Co.: Willis G. Scholl, a group vice-president, was elected executive vice-president and Boyd S. Oberlink was elected vice-president in charge of the tractor group at a recent meeting of the firm's board of directors. Scholl started with the company in 1936 as a salesman, later was assistant manager and branch manager of the Toledo, Ohio, office. He was named sales manager of the tractor division in 1952 and a vice-president in 1955. Oberlink was previously vice-president and general manager of the construction machinery division, succeeding Scholl. In 1943 he was named assistant industrial sales manager and three years later he was elected vice-president in charge of the tractor division.

Seaman-Gunnison Corp.: Donald J. Seaman, Jr., formerly chief engineer of Seaman Motors, Inc., has joined the newly organized Seaman-Gunnison Corp., Baraboo, Wis. In his new position Seaman will carry the responsibilities of engineering and new equipment development. Present Seaman-Gunnison plans contemplate the development and manufacture of new road building equipment, as well as promotion of the long established Gunnison line of asphalt distributors and street flushers.

Wooldridge Manufacturing Div., Continental Copper & Steel Industries, Inc.: Three top level appointments in connection with an extensive expansion has been announced by the parent company. Henry Gusman, who has headed the Wooldridge organization since its founding in 1937,

How wide range of work keeps high-speed loader busy all year 'round



On this road-widening job, surplus materials are loaded from windrow into truck in a matter of seconds. No traffic interference.

Here is a heavy-duty, self-propelled, belt-type loader having a wide range of applications for highway departments. It loads practically any type of loose material out of windrows or stockpiles. In addition to high loading capacity, it gets around fast from job-to-job.

Use Adams TraveLoader for picking up surplus material on road and street construction or reconstruction. Use it for loading materials out of borrow pits and stockpiles. TraveLoader works fast in dirt, sod, sand, gravel, crushed stone, slag, cinders, snow. It loads topsoil for landscaping with no prior preparation.

How it works

TraveLoader loads in any one of a wide range of 5 working speeds from 0.29 to 1.9; has 5 travel speeds from 3.90 to 26.7. The floating, revolving, screw-type feeder automatically adapts itself to the load ahead and places a continuous flow of material on the conveyor-belt. Trucks can be loaded with loose materials at up to 10 yards per minute. Travel speed range makes it easy to keep TraveLoader working to capacity. Trucks load behind loader, do not interfere with passing traffic. Moves job-to-job over highways and city streets at speeds to 26.7 mph.

Heavy, durable construction

All-welded, box-construction, one-piece frame extends full length of machine. Heavy-duty front and rear axles, sturdy feeder mechanism, rigid conveyor with sealed-for-life roller bearings, give TraveLoader the necessary strength to handle heavy loads at fast speeds with minimum downtime and maintenance. *Available with gasoline or diesel engines.*

Easy to operate

You will like TraveLoader's centrally-located control station . . . up out of the dust, permitting clear vision in all directions. Easy, fast, hydraulic controls, give quick adaptability to any working condition.

Get all the facts on the Adams TraveLoader from your LeTourneau-Westinghouse Distributor.



Side-shiftable cross conveyor (optional) loads trucks on either side of machine, assures proper balancing of load. A great time-saver in materials yards. Conveyor position power-controlled from operator's cab.



Cities have many uses for TraveLoader. For instance, ice and snow on city streets can be loaded at the rate of 12 to 20 yards per minute. TraveLoader finds work the year 'round.



Here a contractor cuts and loads gravel out of a natural bank. Many contractors and highway departments use TraveLoader for loading stockpiled materials of all kinds.

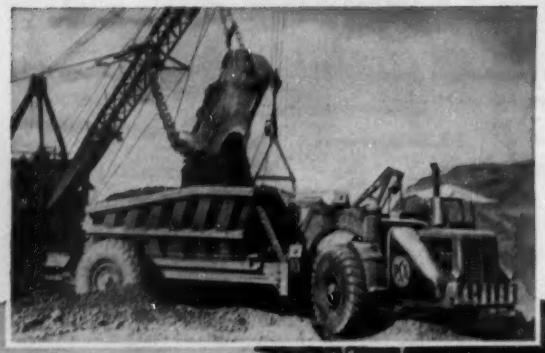
AL-5-G-b

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

"Nylon cord tires reduced off-the-road tire failures . . .





NOW NYLON CUTS TRUCK TIRE COSTS, TOO"

says R. O. LIPPI,

Truck Dept. Mgr., Pacific Coast Aggregates, Inc., San Francisco, Calif.

"When we saw how nylon cord tires cut costs in the toughest of off-the-road service, we began trying them on our trucks, too.

"The results were conclusive. Nylon cords practically eliminated bruise breaks and delays caused by tire failure. We haven't had one blowout with a nylon cord tire! And nylon cord tires give more retreads, more miles per dollar. We expect *double* the mileage we got from ordinary tires.

Switching Whole Fleet to Nylon

"We're sold on nylon—won't buy anything else. We have 126 ready-mix trucks, plus 124 other vehicles. We specify nylon cord tires on all new equipment, and we're replacing ordinary tires with nylon cords."

PROVE TO YOURSELF that nylon cord truck tires give more mileage, more retreads—lowest cost per mile. Ask your dealer about nylon cord truck tires today. (Du Pont makes the tough nylon yarns, does not produce tires.)

DU PONT NYLON for TIRE CORD

DU PONT
REG. U. S. PAT. OFF.

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. . . THROUGH CHEMISTRY



NOW . . . IN PASSENGER-CAR TIRES, TOO . . . THE STRENGTH OF NYLON . . . FOR UTMOST SAFETY . . . SUREST PROTECTION AGAINST TIRE TROUBLE.

How Miller Excavating Co.

hauled mud from 10 feet below water level



Pushed 120 feet by a 190 hp crawler, C Tournapull loads better than 11 pay yards of heavy, wet marl. The "C's" working 8 hours per day, 6 days per week, on this excavation project experienced no downtime for repairs during two months continuous operation.

Excavating 280,000 yards for an underground, U.S. Air Force building, Miller Excavating Company, Omaha, Nebraska, faced the problem of deep cuts in wet clay and steep adverse grades. The company assigned this job to 2 C Tournapulls, a 20-yard tractor-drawn scraper, a dragline, and a 190-hp crawler-pusher.

Machines went to work moving the wet clay and loam so the foundation slab for this three-story building could be laid 10 feet below ground-water level. The deeper the hole was dug, the wetter it became, and the harder to work. Even though the pit was drained by a wellpoint system, material at the bottom of the excavation was soft and slippery. To make matters worse, frequent showers added to the rough going.

"C's" handle mud easily

Traveling through this mud, each of the "C's" averaged a 1000′ cycle in 9 minutes. 132 pay yards were delivered by the 2 units in an average 55-minute hour.

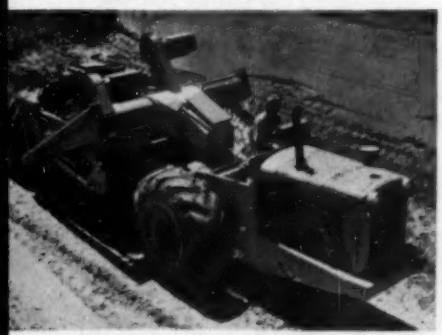
The two "C's" moved 70% of the 280,000 yards involved. 30% was moved by a 20-yard tractor-drawn scraper loaded by dragline.

In the poor footing, Tournapulls' exclusive power-proportioning differential automatically transferred power to the wheel with firmer footing. In extremely slippery underfoot conditions, operator also used Tournapulls' electric power-steer through geared king-pin to pivot prime-mover in alternate directions, "walking" his machine to firmer ground. Steer can swing prime-mover up to 90°.

Compact fill in normal travel

Once out on the fill, "C's" spread full loads over a distance of 71′ in 40 seconds. "C's" big rubber tires helped to compact fill, building a firm surface in ordinary travel.

Says Operator Wm. Welch, "Tournapull is a good machine. This job is rough, but Tournapulls move a lot of earth, handle loads easily."





Working in second gear, C Tournapull hauls 11 pay yards of very heavy wet marl up a steep, slippery grade in this excavation for a three-story, underground office building.

Get the full story

The experience reported here is one of many showing how Tournapulls' rubber-tired speed, electric power-steer, and power-proportioning differential assures lowest-net-cost-per-yard under all job conditions. Write or call your LeTourneau-Westinghouse Distributor for details.

Tournapull—Trademark Reg. U.S. Pat. Off. P-886-P-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

HOW TO HANDLE
WET JOBS

WATERWORKS
SIPHON
Kent, Ohio

Contractor: Engstrom & Wynn



PART-TIME PUMPING DRIES
JOB QUICKLY, CUTS COST

How IMPORTANT is the engineering factor in wellpoint work? This job is a good case in point.

• Soil was coarse sand, overlying an undulating clay base, top of clay being close to subgrade. Confronted with these conditions, contractor quite naturally figured pre-drainage on a basis of continuous pumping 24-hours-per-day.

• Griffin engineers, however, devised a unique layout, using special-screen points and special placement. With this layout, plus careful supervision, the job was speedily dried with only 9 hrs pumping per day (thus bringing operating and fuel costs far below estimate). Yet results were so thorough that drainage influence extended to dewater all footing excavations in the surrounding area.

GRIFFIN
WELLPOINT CORP.
881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.
In Canada: Construction Equipment Co., Ltd.
Toronto Montreal Halifax

SALES AND SERVICE . . .

Continued from page 172

has moved to New York as a member of Continental's management committee. J. D. Gusman, formerly assistant to the general manager, has been appointed general manager of Wooldridge, and E. E. Essage, formerly a vice-president of Thew Shovel Co., is now general sales manager for Wooldridge.

Koehring Co.: The appointment of K. R. Chandler as service manager was announced recently. Chandler succeeds G. N. Nelson, who recently retired after 44 yr with Koehring. A graduate engineer, Chandler has been with the company since 1948.

Joy Manufacturing Co.: The directors recently announced the retirement of J. D. A. Morrow as president and his election as chairman of the board. At the same time, the board elected John Lawrence, formerly executive vice-president, as president and chief executive officer. W. L. Wearly is the new executive president, and H. C. Nyquist was named vice-president in charge of general sales.

Special Mention

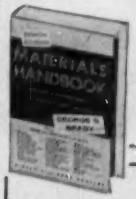
Seaman Engineering: A new firm, to be known as Seaman Engineering and Research Corp., has been established by Harry J. Seaman, a leading authority and pioneer in soil stabilization as employed in highway and airport construction. The new firm will be devoted to the design and development of new types of road building equipment, according to Seaman. Seaman is the inventor and manufacturer of the Seaman Pulvi-Mixer and the rotary type Soil Tillers. The new firm will have its main office in Milwaukee.

LeTourneau-Westinghouse Co.: The Elegrader, a well known motor grader attachment, has become the latest addition to the LeTourneau Westinghouse line of earthmoving equipment. LeTourneau-Westinghouse has announced an agreement to purchase the entire output of the Reiser Corp., manufacturers of the Elegrader, an all-purpose attachment used for loading, terracing, ditching, widening and stripping operations. Engineered and built for use with several motor graders manufactured by the Adams Div. of LeTourneau-Westinghouse, the Elegrader has also been adapted for attachment to the Caterpillar No. 12 grader.

Olin Mathieson Chemical Corp.: The New York headquarters for the Ramset Fastening System, Winchester Western Div. of Olin Mathieson, have been moved to 132 Nassau St., N.Y.C. It was formerly located in Loong Island City. National headquarters remain in Cleveland, Ohio.

MATERIALS HANDBOOK
8th Edition — Just Published!

Presents the most important facts relating to more than 10,000 materials, enabling executives, purchasing agents, and engineers make comparisons, avoid checking many sources, and quickly get a working knowledge of materials best suited for a particular purpose. Eighth Edition gives special attention to new electronic materials, heat-resistant alloys, and other recent advances in materials. Gives detailed information on chief characteristics, comparative data, sources, substitutes, adulterants, and uses for each material. **By George S. Brady, 8th Edition, 1018 pages, $11.00**



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Just Published!

In clear language a noted engineer-attorney discusses 52 important legal problems which may arise on construction projects, such as changes in plans as breach of contract—payment for architectural services—unreasonable delays by owner—liability for negligent acts. Actual cases are cited. Serves as check list of common trouble spots; points out your rights and liabilities; helps you understand law principles behind construction contracts so **you can act to prevent legal difficulties from arising and know when to seek competent legal advice. 487 pages, $6.00**



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Handy legal help — easily understood — to forewarn you of common legal pitfalls. Describes 63 typical problems in the construction field, from contract recission for failure to perform certain work, and acceptance of work as waiver of full or defective performance—to damages from excavating, and your right to recover cost of doing extra work. **Gives facts and contract provisions in each situation. 374 pages, $6.00**

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Clearly describes circumstances out of which construction lawsuits grow, and indicates how you can eliminate them when making contracts. Shows attitudes courts have taken toward 46 everyday legal difficulties liable to crop up in your work at any time, including the right to avoid a contract by reason of mistake in bid—distinction between extra work and additional work—rights of subcontractors to recover when principal contractor defaults on work—and many more. **267 pages, $5.00**
These three books by I. Vernon Werbin, Civil Engineer and Member, N.Y. Bar.

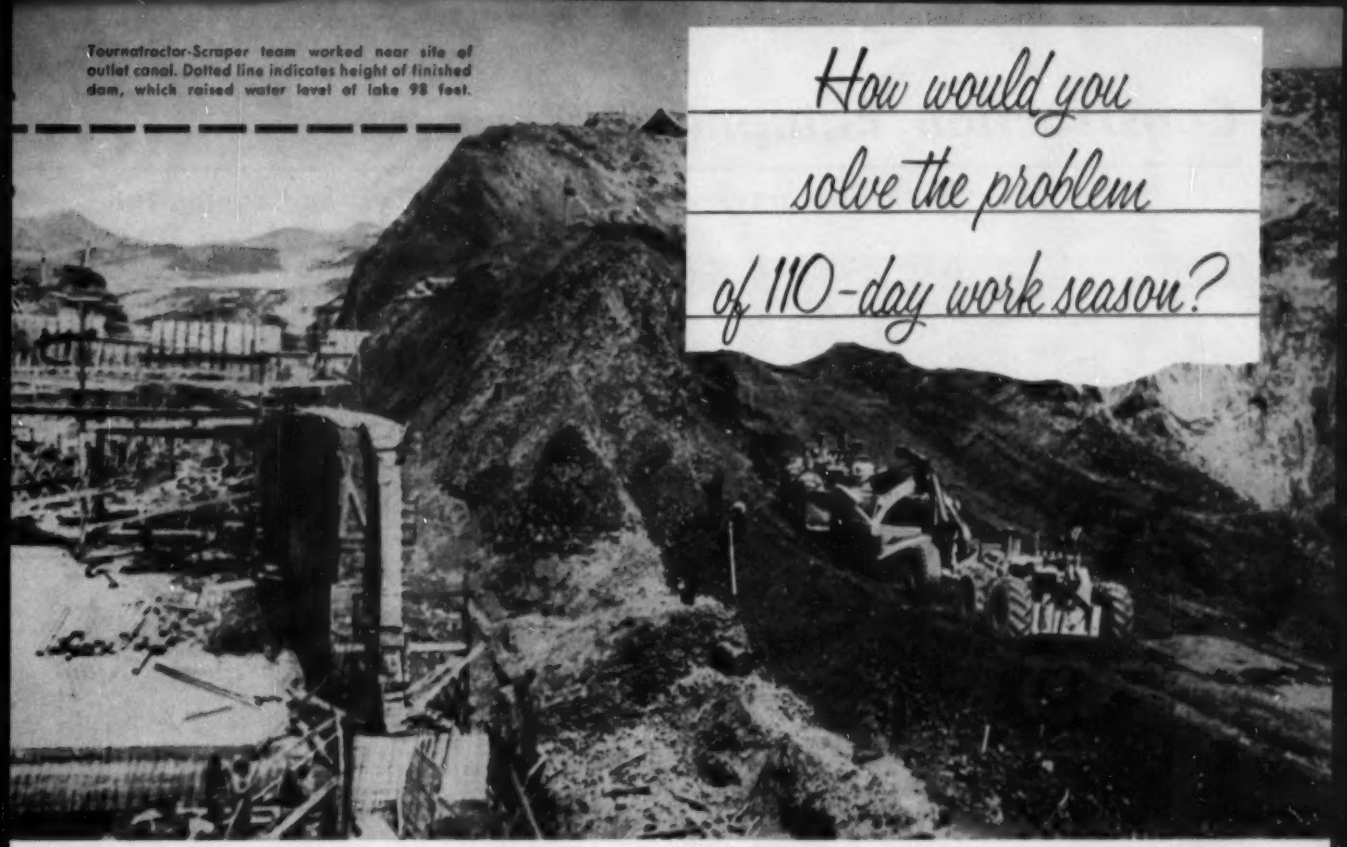
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Tournatractor-Scraper team worked near site of outlet canal. Dotted line indicates height of finished dam, which raised water level of lake 98 feet.

You'd probably do the same thing Endesa did in Chile. They used high speed on rubber to get as much work done as possible during the limited season

Few places in the world ever presented greater difficulties for construction than the mountainous area east of Talca, Chile. Heavy snow — often 32 ft. deep — stopped all work for six months. Spring thaw prevented earthmoving for another month or two. By the time the snow melted and the ground dried out, construction season was reduced to only 100 to 110 working days. Even during this time, conditions were far from ideal. Machines had to load material which rapidly became sunbaked, hard and dry. Hauls were made through heavy dust, and up and down steep grades with horsepower reduced by altitudes of 7800 to 9800 feet.

However, Empresa Nacional de Electridad (Endesa) solved these dirtmoving problems with modern, high-speed, rubber-tired Tournatractors. These tractors-on-rubber started work on the 431,000-cu. yd. earthfill dam across the outlet of Maule Lake, world-famous trout fishing spot. The dam, which is now complete, controls flood waters and generates electricity, increasing prosperity for the entire Talca area, as well as the city of Santiago.

Due to the speed of the Tournatractors, all earthmoving was finished in two seasons (about 220 days). Three of the four tractors were regularly used with 16-cu. yd. LeTourneau-Westinghouse Carryall Scrapers to load, haul, and spread. The other tractor-on-rubber handled push-loading.

Endesa officials say 19 mph speed and ability to maneuver rapidly in close areas, helped Tournatractors out-produce, by a wide margin, the crawler-type tractors they replaced.

"Provide needed speed"

Chief Engineer of Construction, Sr. Santiago Bonhomme, said, "The urgency of finishing this important project made imperative the use of fast earthmoving equipment like Tournatractors. Unquestionably, their traction helped us speed the completion of work."

Tournatractor can offer you high-speed, low-cost production for your projects, too. See your LeTourneau-Westinghouse Distributor.

Carryall, Tournatractor—Trademark Reg. U.S. Pat. Off. T-979-G-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

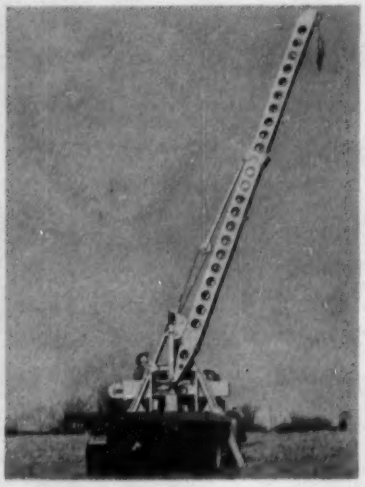
Construction Equipment News . . .

On-the-job previews of Machinery, Tools and Equipment



The Largest Traxcavator

The latest and largest of Caterpillar's expanding line of tractor-shovels is the No. 977 Traxcavator. Utilizing a 2¼-yd bucket, the No. 977 has a differential lever on each side of the lift arms that makes possible 40-deg bucket tipback at ground level. The push of the 100-hp tractor and the thrust of the hydraulic cylinders combine to increase breakout action.—**Caterpillar Tractor Co., Peoria, Ill.**



Telescopic Boom

A boom that telescopes hydraulically is a feature of the 6,400-lb capacity Hydra-Lift. Hydraulic outriggers are another feature.—**Pitman Mfg. Co., 300 W. 79th Terrace, Kansas City, Mo.**



Gets Rid of Green Wood

Within a few hours the No. 75 Rotomist will reduce large piles of green wood to ashes. Actually a giant bellows, the Rotomist blows 20,000 cu ft of air a minute to a distance of 125 ft. To start the pile burning, the Rotomist is set at half throttle, so as not to blow the flame out, and the stack is fired with a flame thrower. When the fire is started, the Rotomist is turned up and the air stream is directed at the ground in front of the stack. When the fire dies down, the operator can introduce oil droplets into the center of the air stream to rekindle the blaze.—**John Bean Div., Food Machinery and Chemical Corp., San Jose, Calif.**



Semi-Automatic Welder

Designed for hardfacing irregularly shaped parts, the MF-semi-automatic welder feeds flux-coated wire. Rate depends on arc size. **—Amsco Div., American Brake Shoe Co., 500 Fifth Ave, New York.**



Grids Contain Fill

While the high points of the grids that form the compaction surface of the Grid Roller exert pressure, movement of fill material is limited to the 3½-in. square openings between the bars. A cleaner, mounted on the roller frame, removes sticky material entering through the grid openings. With concrete and sand ballast, unit weighs 30,000 lbs.**—Hyster Co., 1800 N. Adams St., Peoria, Ill**



Portable Crushing Plant

Eagle's new 125-yd per min single pass crushing plant has a roller bearing jaw crusher with a one-piece welded frame. Jaws can be adjusted from 1 to 5 in. and are reversible for extra wear. Both feed and discharge conveyors are powered independently of the crusher. For highway travel, discharge conveyor folds back over the crusher.**—Eagle Crusher Co., Galion, Ohio.**



Shuts Itself Off

Ingersoll-Rand's new Torque Control Impactool is an air-operated nut-running tool that impacts the nut to a preset torque and then automatically shuts itself off. Since the new tool, which incorporates



Only
GOODALL
Gives You This Assurance of Extra **SAFETY**

"INFERNO" Steam Hose
With the **BLACK SPIRAL STRIPE**

That black spiral stripe on the familiar red cover of "Inferno" shows at a glance that the steam hose selected for pile driving and other heavy-duty steam jobs will assure ***unquestioned safety,*** regardless of the severity of the service. There can be no mistaking an unsafe hose for the one built to stay on the job longer, without risk of bursting and consequent danger to men and damage to equipment.

"INFERNO" STEAM HOSE specifications include high-temperature tube; multiple-layer, braided steel wire carcass; wear- and weather-resistant "Synplastic"® cover. Sizes ½" to 3", inclusive, in maximum lengths of 50 feet.

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AND OTHER INDUSTRIAL RUBBER PRODUCTS

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GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.
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the torsion bar principle to torque control, does not depend on the operator's sense of timing, accurate and uniform bolting is assured even with inexperienced crews. Ingersoll-Rand likens the action of the tool to that of a pogo stick. While the nut is being run to the required torque, the Impactool operates at normal power and speed, but when the required tightness is reached, the impact mechanism rebounds instantly and trips a rubber-faced shutoff valve.

The tool can be set to the required torque in a few seconds by using a jig that turns a torsion bar



and calibration collar to the desired reading. The torque setting then remains constant until the adjustment is changed. Releasing the trigger resets the tool automatically to the same torque for the next nut. Nuts are run fast because the operator is not afraid to open the throttle wide.

The Impactool is available in two sizes. For the construction industry, the 5340T model can be adjusted through a range of 14 calibrations up to a maximum of 550 ft-lb. This size will run both ¾-in. and ⅞-in. bolts. It weighs 31.5 lb, is 24.5 in. long, and delivers 1,270 impacts per min. while using 45 cfm of air.

The smaller model, the 5040T (above) is available with two torsion bars, one with a maximum torque of 60 ft-lb and the other with a maximum torque of 90 ft-lb. The lighter model, handy for maintenance shops, weighs 6¼ lb, is only 10½ in. long, and delivers up to 2,100 impacts per min.—**Ingersoll Rand, 11 Broadway, New York 4, N.Y.**

(Continued on page 184)

(Advertisement)



LOOKING DOWN vertical shaft to tunnel driven 33 feet under six-lane highway. Unaffected by weather conditions, men work around the clock in tunnel headings. Steel plates line shaft and tunnels, protecting men against cave-in.



MINING IN TUNNEL progresses close to pay line. When 4 square feet of ground is exposed, man bolts next plate into ring.

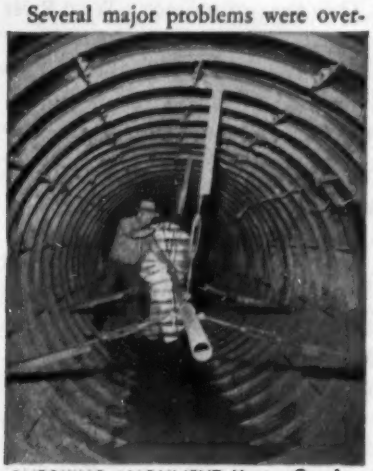
How COMMERCIAL tunnel liner plates are a time and money saving answer in soft ground tunnel construction. . .



REMOVING MUCK from heading places additional load of 1500 pounds on monorail system suspended from steel liner plate lining.

RAPID PROGRESS is being made in driving 8400 feet of tunnel at depths as low as 33 feet below the surface by Mountain State Construction Company for the Sanitary Board of the City of Charleston, W. Va. Tunnels 84" and 68¾" in diameter, when completed later this year, will become part of the project that will intercept and pick up existing sewage lines now dumping into the Kanawha and Elk Rivers and divert the flow of all raw sewage to a new disposal plant now under construction.

Several major problems were overcome when consulting engineers decided, and the contractor agreed, that the steel tunnel liner plate system was the ideal method to use in driving these tunnels. I.V. Cunningham, Owner of Mountain State, says that he is using 2,000,000 pounds of COMMERCIAL steel liner plates because simplicity of the COMMERCIAL system makes rapid progress possible even though tunnels are being driven close to the river in wet ground where cave-ins are a constant hazard and beneath Kanawha Boulevard where traffic continues uninterrupted on one of Charleston's busiest arteries.



CHECKING ALIGNMENT, Vernon Cunningham says, "Once the first few feet of tunnel liner plates are in place, the remaining rings are practically self-aligning."

LA-14

Setting the proper ground support quickly as mining progresses in the heading of a soft ground tunnel is of utmost importance. COMMERCIAL liner plates are curved to the exact required radius and because of their size, weight and design, one man can easily and quickly set them into place. Bolts are slipped through matching holes punched in the four inside flanges of the plates and nuts tighten up quickly with the use of only a spud wrench. There is nothing awkward in bolting the COMMERCIAL plate into place because everything is out in the open and you see just what you are doing.

Starting this contract with unskilled workmen, Mountain State has found that it worked out perfectly to let their men learn the COMMERCIAL liner plate system on the job, and in short order the crews performed as teams. With actual physical labor reduced to a minimum and the fear of cave-in hazards negated, Vernon Cunningham says, "They are happier workers than any I have seen in all my years in the construction business. This, of course, pays off in results. For my own part, I have found the COMMERCIAL liners a time and money saving answer to a difficult construction problem."

Can we be of assistance to you on your next tunnel job? There's no obligation.

THE COMMERCIAL SHEARING AND STAMPING COMPANY
Youngstown, Ohio Chicago, Illinois Salt Lake City, Utah

COMMERCIAL
shearing and stamping

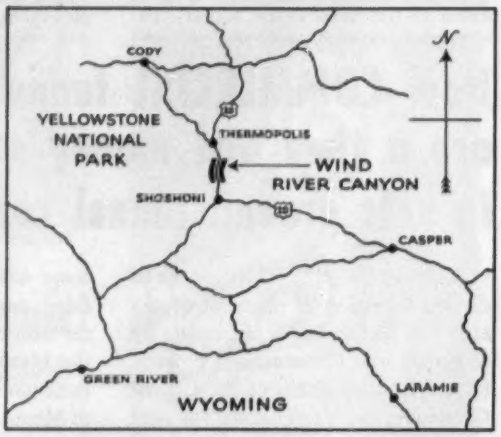


'I've never hit a tougher rock job in my 28 years in these mountains'

DAN RATLIFF, *Superintendent for the Wind River Project Contractors, the* INLAND CONSTRUCTION COMPANY

ATLAS COPCO DRILLS DRIVE THROUGH SOLID ROCK ON WIND RIVER CANYON HIGHWAY, WYOMING

Wind River Canyon is eleven miles long; a principal route to the Yellowstone National Park. Cut out of the precipitous canyon walls over six-thousand feet high is a railroad and a twenty-year-old highway packed with tourist traffic during summer. To ease congestion and to eliminate danger spots on the highway, Wyoming's State Highway Department decided to carry out extensive modifications.



ATLAS COPCO BREAK NEW GROUND

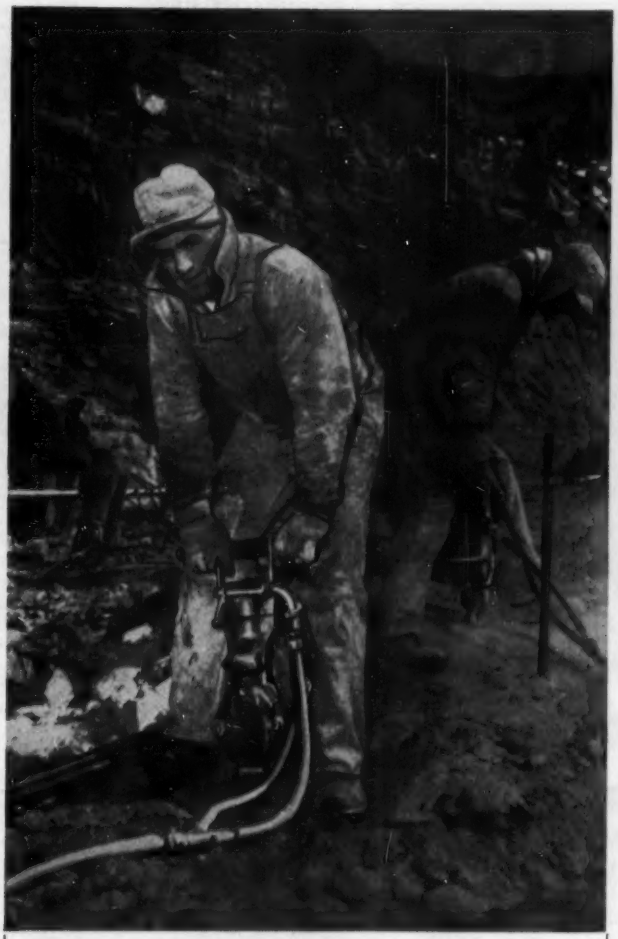
Rock work was a major part of the project, with 200,000 cubic yards excavated for dumping. The maximum cuts, 1,000 feet long, 95 feet deep and 60 feet wide, were in areas of solid rock; a conglomerate of diorite, red granite and badly fissured sandstone and limestone. This was the type of ground once kept for the heavy wagon drill. The Inland Construction Company drew on past experience, swept aside convention and chose Atlas Copco light, *one-man* rock drills and Sandvik Coromant integral steels to do the job instead. Their choice gave them rock-drilling equipment costing at least fifty per cent less! The drills and steels were supplied by Atlas Copco Pacific Inc. In spite of solid rock, below-zero temperatures and restricting blasting requirements, Atlas Copco drills and Sandvik Coromant steels once again showed themselves to be the world's leading drilling combination. Their fine performance in Wind River Canyon is indicated in the low figure of 1.15 feet of drilling for each excavated cubic yard of rock. Low powder costs reported from Wind River Canyon can be attributed to the small bit diameter of Sandvik Coromant steels.



UNBEATABLE DRILLING UNIT

Atlas Copco light rock drills and Sandvik Coromant tungsten-carbide-tipped steels started a revolution in the drilling field when introduced some ten years ago. Developed closely together, they make an unbeatable unit.

The Atlas Copco light, one-man rock drill itself is a versatile machine. On Wind River Canyon they were used for benching. With the addition of a pusher leg, any one of them could have been adapted for tunnelling *in minutes*.



Two Atlas Copco light rock drills in operation in Wind River Canyon. Fifteen of these drills excavated 200,000 cubic yards of rock. All were fitted with Sandvik Coromant tungsten-carbide-tipped steels.

EXTRA-TOUGH COROMANT STEELS

Sandvik Coromant steels are extra-tough! You can be sure of a quality that never varies. This is because Sandvik control every phase of production—from the mining of iron ore, processing of wolfram ore to the final tungsten-carbide tips used throughout the world wherever Atlas Copco drills are in action. Wind River Canyon project is another example of how this outstanding combination can bring *new* speeds and *new* economies to drilling—*even under the toughest conditions.*

The Atlas Copco Group puts compressed air to work for the world. It embraces thirty-one Atlas Copco companies and twenty-four agents, manufacturing or selling and servicing Atlas Copco equipment in more than 50 countries throughout the world.



This Atlas Copco portable grinder was able to service drills on the site; saved drilling delays and overtime costs.

MAIL THIS COUPON *to the most convenient of the addresses given here:*

U.S.A., Atlas Copco Pacific, Inc., 930, Brittan Avenue, San Carlos, California; Atlas Copco Eastern, Inc., P.O. Box 2568, Paterson 2, N.J.; CANADA, Atlas Copco Canada Ltd., Montreal, A.M.F., P.Q.; MEXICO, Atlas Copco Mexicana S.A. Apartado Postal 56, Torreon, Coahuila.

UNITED KINGDOM, Atlas Copco (Great Britain) Ltd., Wembley, Middx.; FRANCE, Atlas Copco France S.A., 29, Rue Marbeuf, Paris 8e; HOLLAND, Atlas Copco Holland N.V., P.O. Box 6056, Rotterdam; ITALY, Atlas Copco Italia, S.p.A., Viale Marche 15, Milan. AUSTRALIA, Atlas Copco Australia Pty. Ltd., P.O. 54, Auburn, N.S.W.; SOUTH AFRICA, Delfos & Atlas Copco (Pty.) Ltd., P.O. Box 504, Benoni, Transvaal.

Readers in countries outside those listed above and who do not know the name of their local Atlas Copco company or agent, please write to Atlas Copco AB, Stockholm 1, Sweden.

Please forward details of ***Atlas Copco Rock Drills and Sandvik Coromant Drill Steels***

NAME .....

COMPANY .....

ADDRESS .....

.....

*I am also interested in other Atlas Copco equipment (Please state which below)

.....

42/6

* *Manufacturers of Stationary and Portable Compressors, Rock-Drilling Equipment, Loaders, Pneumatic Tools and Paint-Spraying Equipment*

THE ATLAS COPCO GROUP OF COMPANIES



"Sherman Loader Best Unit in the Business"

Stanley Lindholm, subcontractor from Welch, Minnesota, has many enthusiastic comments to make about his Sherman AJ-25 Front End Loader. When he decided to buy a loader for his Fordson Major Tractor, he looked at just about every model available. He saw them demonstrated, checked the specifications of each and compared the prices. "After all the checking I did", said Mr. Lindholm, "there was only one decision I could make—to buy the Sherman Loader. Since then I have used it on all kinds of jobs and can say quite frankly that for the type of work I do, it is the best unit in the business."

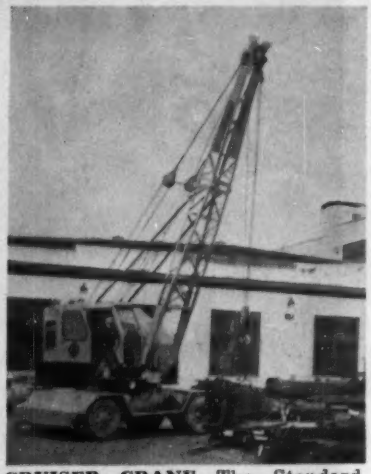
As a subcontractor, Mr. Lindholm is called out on all kinds of jobs, each with its own particular problems. He works very closely with many of the contractors in his area and most of his work is done for Ed Axelson, a plumber from the nearby town of Hastings. He digs basements, footings, and pipelines with his Sherman Digger and uses the Front End Loader for backfilling, (see photo above) and loading dirt and gravel in the trucks.

Mr. Lindholm is but one of the many contractors who are finding that the Sherman Digger-Loader combination is the most economical and productive unit in the business. Two Loader models are available . . . up to 2500 pounds bucket and 4500 pounds breakaway capacities. Sherman Loaders and Diggers are both sold and serviced locally by your Ford Tractor Dealer. See him today for a demonstration or write for free Bulletin No. 833.

Sherman
PRODUCTS, INC.
ROYAL OAK, MICHIGAN
POWER DIGGERS • FRONT END LOADERS* • FORK LIFTS

*Manufactured Exclusively for Sherman Products, Inc. by Johnson Hydraulic Equipment Co., Minneapolis, Minn.

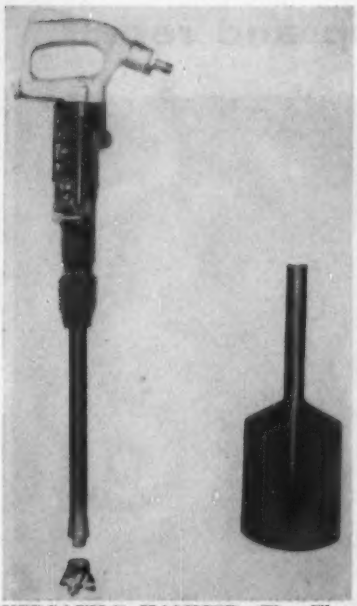
©1955, Sherman Products, Inc.



CRUISER CRANE—The Standard model 205 Koehring excavator has been mounted on a four-wheel drive body that turns in 27½-ft. Powered by a single-engine, one man can drive or work the rig. Called the Cruiser Crane, the unit has a 15-ton lifting capacity, ½-yd dipper capacity, and top travel speed of 21 mph. It is designed specially for jobs where materials must be shifted quickly from one job location to another. Standard features include power steering, air-hydraulic brakes and a standard torque converter. For high lifts, the standard 25-ft boom can be lengthened to a maximum of 55 ft and straight boom jibs of 15 to 30 ft can be added. Power boom lowering is standard. The cruiser body is equipped with front and back outriggers that give increased stability when lifting. Total weight of the unit is 29,400 lb, with the rear axle load without counterweight listed at less than 18,000 lb to conform with highway regulations.—**Koehring Co., 3026 W. Concordia Ave., Milwaukee 16, Wis.**



SPRAYER—The versatility of the Smith Banner compressed air sprayer should appeal to contractors. Consisting of a 4-gal corrugated tank of either galvanized steel or solid copper and a 30-x⅜-in. hose section that feeds to a 24-in. trigger-controlled nozzle, the unit is handy for spraying concrete forms, spraying silicon water repellents for masonry work, and numerous other jobs. The tank has a large 5½-in. dia open top for quick easy filling and cleaning. A funnel top is also available.—**D. B. Smith & Co., Utica, N.Y.**



VERSATILE HAMMER—The Thor utility hammer can be used as either a rock drill or as a cement chipping hammer, thanks to its "stop rotation" feature. A simple external cam level control on the 14-lb tool permits instantaneous change from rotative to straight hammering action when the tool is to be used for starting holes, chipping light clay digging and demolition work. The tool is offered in two models, the 15D, for use as a dry tool and the 15W, for use as a wet tool when dust control proves a problem. The 15W is the same as the 15D except that it is equipped with a water inlet swivel, shut-off valve, inlet plug and port plug. Length overall of the tool is 17½ in., with ⅜-in. air hose inlet provided. Standard chuck is ⅞-in. hexagon 3¼-in. Attachments available include paving breaker moil points, clay digger spades, and adaptors permitting a variety of standard star drills.—**Thor Power Tool Co, Aurora, Ill.**

TRACK MASTER PIN REMOVER—A hydraulic tool, powered by a 50-ton ram, has been developed by the Owatonna Tool Co. to remove and install track master pins on Allis Chalmers and International tractors. The device saves time and makes the job easier when it becomes necessary to split the track to replace a bearing or do other maintenance work, the manufacturers claim. It can be bought separately as an attachment to the OTC Power-Twin center-hole ram. The hydraulic ram can be used with other attachments to handle such jobs as compressing track and accumulator springs on the International TD-24, pulling or installing drive sprockets and installing truck axle tubes and sleeves. It can serve as a portable power unit in the field or shop. **Owatonna Tool Co., Owatonna, Minn.**

(Continued on page 187)



Tough Contract Completed—Thanks to a Sherman Power Digger!

Mr. K. M. Johns, earthmoving contractor from Westminster, South Carolina, was in trouble. After contracting with a neighboring city to lay an eight inch supplementary water line through the center of town, he discovered that his excavating equipment was too large and unwieldy to work between curb and sidewalk. To use such machinery would have meant re-routing traffic along the entire route at great extra expense to the city.

Mr. Johns' problem was solved by the purchase of a Sherman Power Digger. Mounted on a Ford Tractor, the unit maneuvered easily between curb and sidewalk and the job was completed on time and at a profit.

Sherman Power Diggers are earning an enviable reputation among contractors for versatility, compactness and maneuverability. They dig faster . . . up to ten feet below grade in mud, hardpan, shale, blacktop, and stony ground. Sherman Diggers are sold and serviced locally by your Ford Tractor Dealer. See him today for a demonstration or write for free Bulletin No. 831.

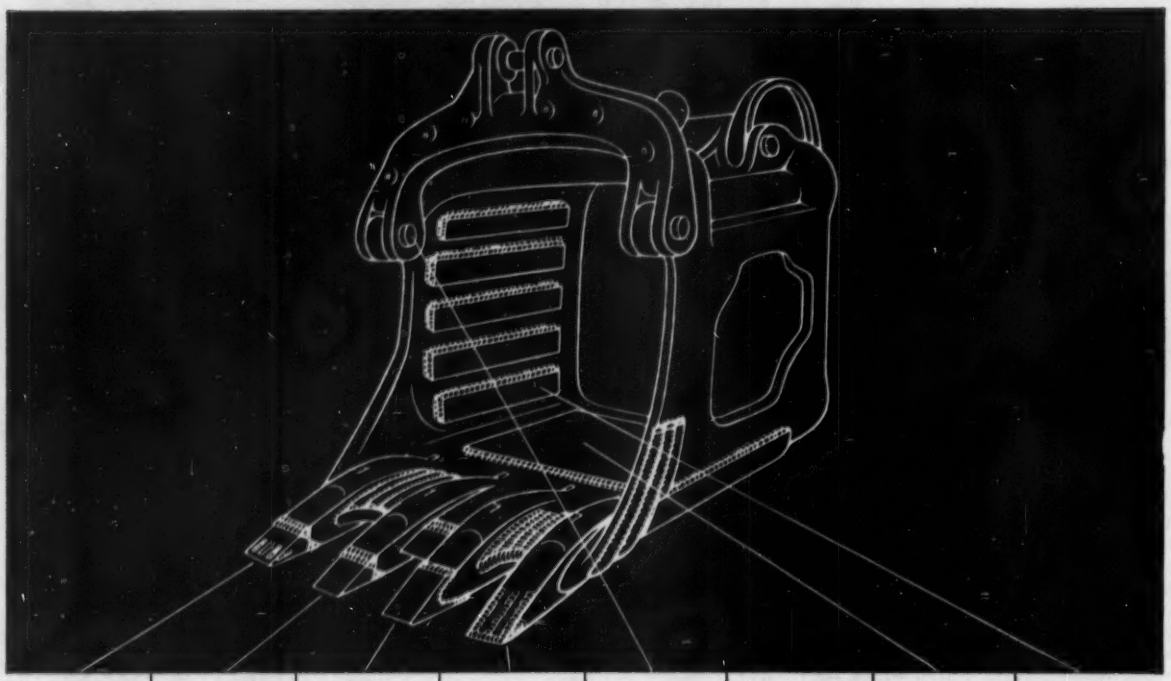
*Designed, Engineered and Manufactured Jointly by Sherman Products, Inc., Royal Oak, Michigan, Wain-Roy Corporation, Hubbardston, Mass.

Patent No. 2-303-852
Other Patents Pending

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Sherman
PRODUCTS, INC.
ROYAL OAK, MICHIGAN
POWER DIGGERS* • FRONT END LOADERS • FORK LIFTS

For EXTRA TOUGH build-up and repair





. . . use AMSCO® MANGANESE STEEL

Put manganese steel at the points of maximum wear and operate equipment longer between repair periods. Amsco manganese steel outlasts other steels by as much as ten to one under conditions of heavy impact and severe abrasion.

Impact work-hardens the metal to as high as 550 BHN. Further abrasion only polishes this tough steel. Amsco Bulletin WA-77 will show you how and where you can make extensive savings using Amsco manganese steel shapes. Write for it today.

For immediate savings, contact your Amsco distributor. He stocks a complete line of manganese steel shapes and welding equipment. Welding products are distributed in Canada by Canadian Liquid Air Co., Ltd.

Amsco also produces other alloy steels with maximum wear-resistance under particular service conditions . . . and a complete line of hardfacing welding equipment, both rods and machines.

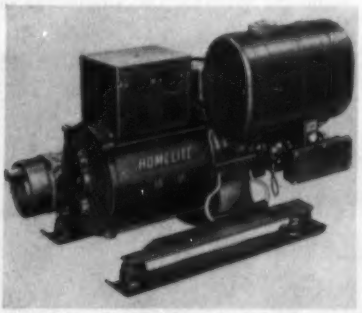
AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Ill.



REDESIGNED WELDMOBILE—Larger wheels in the rear, implement tires in front, and increased ground clearance at both axles have increased the mobility of the new Weldmobile. The Weldmobile is a self-contained, self-propelled welding unit with the engine directly coupled to the generator. The 400-amp model is powered by a six-cylinder Chrysler engine and the 600-amp model is powered by a Chrysler V8 engine. Both models can also supply one kilowatt of 110-v dc power for lights or electric tools.—**Hobart Brothers, Co., Hobart Square, Troy, Ohio.**

SAFE AIR HOSE—A new air hose, reinforced with braided steel wire, offers extra safety at pressures to 2,000 psi. Strong enough for air hose service on the heaviest machinery, it is light and flexible enough to be practical for pneumatic tools, according to the manufacturer. Besides the steel braiding, the hose has a neoprene tube that withstands heat and a bright yellow cover that makes it easy to see. The hose is called Super-Master BW.—**Manhattan Rubber Div., Raybestos-Manhattan, Inc., Passaic, N. J.**



SMALL GENERATOR—Small size, light weight, and close voltage regulation are features of the model 35A115 generator. Easily carried by one man, the generator delivers 1,500 watts, can be quickly set up to service up to four electrically powered tools. It is classified as a 115-v, 60-cycle ac generator. According to the manufacturers, close regulation limits the voltage change to only 4% from no load to full load. Intermediate couplings are eliminated because the armature is keyed directly to the crankshaft of the single-cylinder, two-cycle engine. — **Homelite, Port Chester, New York.**

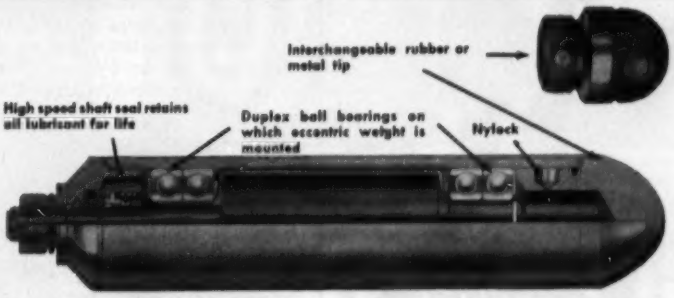
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New, rugged electric vibrator, newly designed vibrator head delivers 9000 VPM at 2 HP

This new electric concrete vibrator, developed by STOW MANUFACTURING COMPANY, Binghamton, N. Y., features a new lightweight vibrator head that delivers, at high amplitude, 9000 vibrations per minute to the mix.



This vibrator, STOW model BU, is powered by a totally enclosed 2 HP Universal motor, operating on 115 volts, AC or DC, 25 to 60 cycles. The motor is protected by a skid mounting, so arranged that the unit can be easily pulled around by the flexible shaft.



Take a look at this vibrator head. It is 10 inches long, and available in diameters of 1⅝, 2 and 2½ inches, capable of 9000 VPM. Vibrations are achieved by use of an eccentric weight mounted in special high speed duplex ball bearings at each end. The outside of the head is case hardened, for extra long wear, and it has a replaceable tool steel tip. STOW estimates that these two improvements alone will double the life of the heads.

Construction men report that they like the light weight, the long life, the low replacement cost, and the terrific wallop of these heads. Weight of the 1⅝" head is about 5 lbs.; the 2" head, about 7½ lbs.; the 2½" head, about 9 lbs. The cost of this head is less than 1/3 the cost of expensive motor-built-in type heads.

The 1⅝" head is also available with a hard rubber tip for use where plywood forms are being used.

For more information about the complete line of STOW concrete electric and gasoline vibrators, vibrating screeds and rotary trowels, contact your STOW distributor, or write for STOW catalog 552!



STOW

STOW MANUFACTURING CO.

31 SHEAR STREET, BINGHAMTON, N. Y.

We challenge you
to find better
PROTECTIVE CLOTHING!



illustrated above: ¾ length coat

Sawyer

For every industry where personnel protection and safety are vital, only Sawyer Neoprene Latex Clothing offers all these advantages:

- 100% protection against oils, chemicals, alkalies, abrasion — and other hazards!
- "Exclusive Coating Process" . . . (for years and years of extra wear and durability) — original with Sawyer!
- guaranteed not to peel, blister or crack in ordinary usage!
- double interlocked sewn seams that can't come apart!
- solid brass or non-conductive fastenings that can't rip off or corrode!
- designed for roomy, action-free comfort!

Sawyer clothing also Rubberized or Oiled. Full range of jackets, pants, coats, hats, aprons for more efficiency, more economy, more protection on every job!

Make us prove it!

Send for complete details and price list.

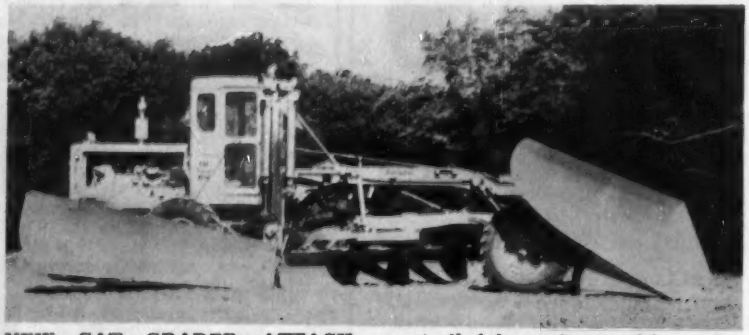
The H. M. Sawyer & Son Company
A Division of Sawyer-Tower, Inc.
specialists in Protective Clothing for more than a century
9 Thorndike St., Cambridge 41, Mass.



JAEGER MIXERS—The latest Jaeger standard Model D truck mixers feature shortened centers of gravity, reduced weight, and three-speed transmission with single lever control. The new transmission offers a range from 2-rpm drum speed at 1,000 rpm engine speed, for discharging into wheelbarrows, up to 17-rpm drum speed at 2,000 rpm. The mixers are available in sizes ranging from 3½ yd to 8½ yd. Discharge blades have been enlarged 25% to facilitate faster charging and discharging. The open-end loader has also been enlarged to take advantage of the 17-rpm drum charging speed. Construction features include welded drums with continuous spiral blades and reversing throw-back blades, one-piece rolled steel drum tracks, and large drum rollers. Drums are driven by a 56-in. dia sprocket with replaceable steel teeth and a sidebar chain.—**Jaeger Machine Co., Columbus 10, Ohio.**



MORE AIR—Jaeger has increased the air delivery of its middle-sized compressor from 316 to 365 cfm. The new rotary also has a slower full load speed of 1,700 rpm. Two-stage compression, continuous regulation of engine speed to air demands, an 8-hr fuel tank are other features. The compressor is powered by a model 4-71 General Motors diesel. —**Jaeger Machine Co., Columbus 16, Ohio.**



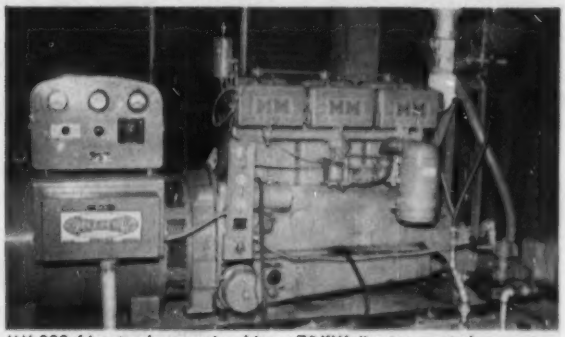
NEW CAT GRADER ATTACHMENTS—A hydraulically shiftable moldboard, hydraulically operated snow plow and bulldozer mounting, and hydraulically actuated snow wing have been designed for the No. 12 and No. 112 Caterpillar motor graders. The new shiftable moldboard is concave in shape to allow for the hydraulic cylinder. The stroke of the cylinder is 48 in. with 27 in. of travel to the right and 21 in. to the left. Greater strength is claimed for the new snow plow and bulldozer mounting. The cylinder is controlled by a four-position valve that allows floating but gives down pressure when necessary. The snow wing is controlled by two cylinders mounted on the mast at each end of the unit. This control increases speed when moving the snow wing around obstacles. Power for the attachments is supplied from a hydraulic system mounted on the dashboard. Valves can be stacked to allow any or all of the attachments to be used together.—**Caterpillar Tractor Co., Peoria, Ill**

(Continued on page 190)

High-Production Equipment deserves Honest HP



MM 283-4A gasoline engine powering a Lindig Soil Shredder. Compact, easily installed MM engines provide a permanent, integral power source for a wide range of portable equipment.



MM 800-6A natural gas engine drives a 75 KW direct-connected generator. Equipped with automatic remote control, this unattended stationary plant supplies regular or standby power.

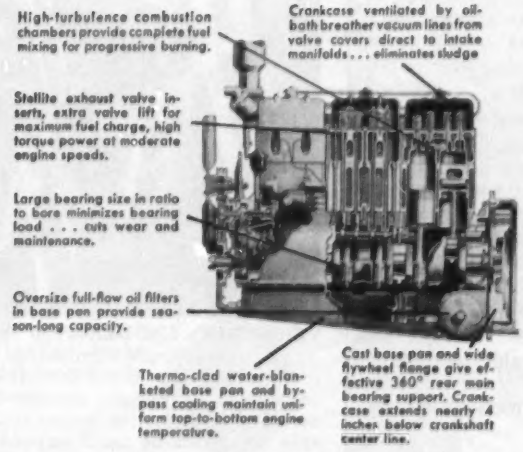


MM 605-6A gasoline engine supplies low-cost power for this big-capacity American stationary hoist. High torque MM power units respond with steady rpm to intermittent or changing loads.



MM 403-4A gasoline engine mounted on a Warner-Swasey Gradall. Choice of gasoline, diesel, LP gas, natural gas or distillate fuel equipment offers continuous-duty MM power at lowest fuel costs.

Here's how MM builds Honest HP



MM ENGINE SIZES

4 Cylinder Carbureted Models*		6 Cylinder Carbureted Models	
MODEL 206A-4A	3⅜" x 5"	MODEL 425-6A	4¼" x 5"
MODEL 283-4A	4⅛" x 5"	MODEL 605-6A	4⅛" x 6"
MODEL 403-4A	4⅝" x 6"	MODEL 800-6A	5⅛" x 6"

*Engineered for gasoline, distillate, natural or LP gas.

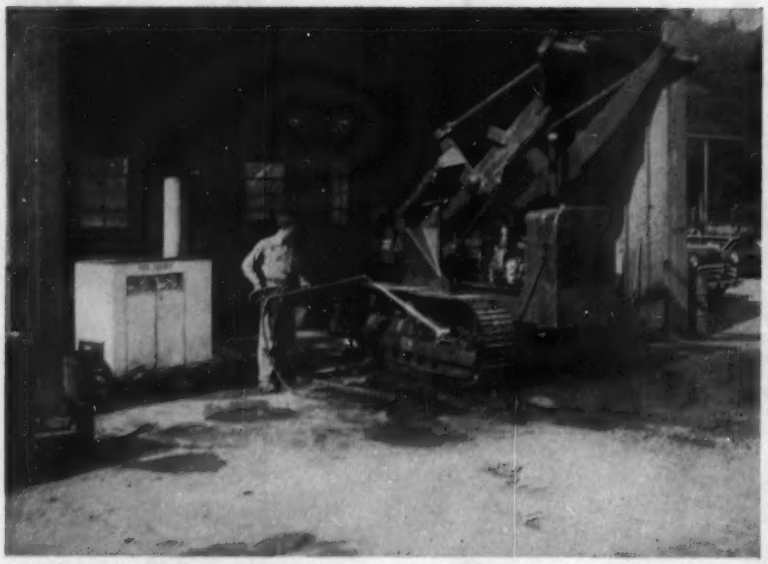
4 Cylinder Diesel Models		6 Cylinder Diesel Models	
MODEL D-283-4A	4¼" x 5"	MODEL D-425-6A	4¼" x 5"
		MODEL D-605-6A	4⅛" x 6"

Honest horsepower is horsepower developed at operating speeds that are practical for heavy continuous duty. That is why Minneapolis-Moline engines are designed to develop maximum torque at around 1000 rpm and are power rated at from 1200 to 1400 rpm. Deep-pocket, high-turbulence combustion chambers for progressive fuel burning and prolonged pressure combined with large displacement and high compression ratios enable MM engines to deliver work-type power at usable speeds. Where special installations require higher rpm with rapid acceleration, MM engines can be furnished with aluminum pistons.

MM engines are stocked in various fuel models and standard equipment bundles for quick delivery. You can buy bare engines, engines with radiator, fan and power take-off, or complete enclosed units. Modification of standard units on separate production runs to meet special requirements are part of the flexible MM operation that saves you time and money.

If your design calls for long-run industrial engine power that will last the life of the equipment, we will be pleased to furnish a prompt quotation and shipping date for a pilot model built to your specifications.

MINNEAPOLIS-MOLINE
INDUSTRIAL DIVISION
MINNEAPOLIS 1, MINNESOTA



Malsbary 250 HPC cleaner blasts heavy clay, grease and tar from earthmoving equipment; cleans grease and oil from parts, motors and tracks during overhaul; strips paint from used equipment for Frantz Tractor Co., Inc., Bronx, N. Y.

Look what you can do with a
Malsbary HPC Cleaner

If you own a Malsbary HPC (high pressure combination) cleaner you can use:

1. High pressure hot solution to 300-400 p.s.i. at 325° F. to soften and blast away waterproof greases, tars, corrosive oil and dirt.

2. High pressure cold water to 300-400 p.s.i. for rapid removal of caked mud and dirt, or cold rinsing after steam cleaning.

3. High pressure hot water to 300-400 p.s.i. at 200° F. to melt and remove ice and frozen mud, or to rinse equipment.

4. Low pressure wet steam (15-30 boiler hp.) to degas and clean tank interiors or for general heating and thawing.

5. Low pressure warm water for washing trucks, tractors, etc.

Cleans Faster Too – because Malsbary HPC cleaners combine pumped hydraulic and steam pressures (an exclusive, patented Malsbary feature), you have a cleaning force and range unmatched by any other steam cleaner on the market. A Malsbary HPC will handle any cleaning job twice as fast as any steam vapor cleaner (regardless of volume), and does most cleaning four to ten times faster. Try it.

You Can Reduce Downtime still further with big Series 300 and 500 HPC cleaners. They operate two or more guns simultaneously, one delivering high pressure cold water, the other high pressure hot solution – a real time saver on big rigs and fleets.

Can your steam cleaner handle all these cleaning jobs? If not, ask your Malsbary dealer to demonstrate an HPC cleaner on your job... or write us today for catalogs 250 and 500.



Malsbary 250 HPC completely cleans this shovel in 4 hours.

MALSBARY
SINCE 1921 MANUFACTURING CO.
Room C, 845 92nd Ave., Oakland 3, Calif.

82



PORTABLE PAGING SYSTEM—The Radionic Ultra Sonic portable public address system operates economically on four 6-v dry batteries. There are no adjustments to make, or dials to turn. Simply pick up the small microphone, press a button and start talking. The unit consists of a 10½x6x4¼-in. case, a trumpet-type aluminum speaker, the microphone and 8-ft extension cord. The unit, which sells for $99.50, has a range of a quarter of a mile.—**Radionic Industries, 321 W. Hubbard St., Chicago 10, Ill.**



VERSATILE LADDER—The back legs of a new magnesium ladder can be extended and locked to form an adjustable, lightweight straight ladder. The back section is also adjustable so it can be used on uneven levels such as stairs. The ladders have 3½-in. steps and 3½-in. rail sections. Serrated hard rubber caps prevent slippage. The ladders range from the 13-lb, 6-ft size selling for $33.; to a 22-lb, 10-ft model selling for $60. The larger size extends to 18 ft.—**Abbeon Supply Co., 179-33 Jamaica Ave., Jamaica 32, N.Y.**

(Continued on page 193)

8 Reasons Why UNI-FORM Panels are the most widely used Prefabricated Form in the Industry

VERSATILITY

Uni-Form Panels will form straight, irregular, curved, battered walls . . . slabs, beams, columns, piers—everything from small house foundations to massive concrete structures.

COMPLETE — READY TO USE

The Uni-Form Panel System is complete, ready to use when it reaches the job. Eliminates field fabrication. Result: FASTER JOB STARTS.

FAST ERECTION

Simple assembly of easy to handle panels increases productivity of labor. Form more contact area per man hour with Uni-Form Panels.

AUTOMATIC ACCURACY

Assembly of Panels with Uni-Form Ties furnished for any wall thickness insures automatically accurate forming. Tie positively locks and spreads panels. No measuring . . . no guesswork.

LUMBER SAVINGS

You use less lumber in Uni-Forming. Steel-framed panels erect into a tight, rigid form requiring minimum alignment and bracing on 1 side only—regardless of height. Saves labor too.

FASTER STRIPPING

Less alignment and bracing lumber . . . fewer parts to remove means faster stripping, lower costs.

LONG LIFE

Rugged steel frame designed for fast pouring, cradles and protects plywood edges . . . permits maximum re-usage of plywood (actually 50 times or more) before replacement is necessary. Minimum panel maintenance required . . . lower material costs.

EXPERT ENGINEERING SERVICE

Universal's engineering staff and field engineers provide competent, specialized assistance, backed by over 40 years of experience in concrete forming.

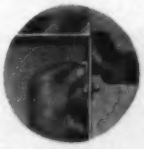
Branch Offices and Warehouses at: Los Angeles • San Leandro, Calif. • Houston, Texas • Cleveland, Ohio • Baltimore, Md. • Atlanta, Ga.

3 SIMPLE STEPS FOR ASSEMBLY

1. Insert Tie loop in Panel tie hole.

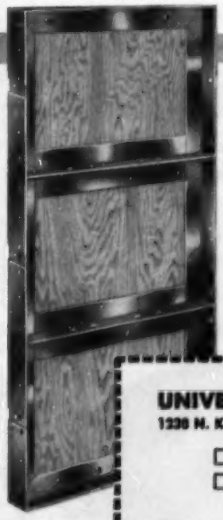


2. Tie Key locks Uni-Form Tie to Panel.



3. Tie loop receives adjacent Panel. Insertion of Tie Key completes tieing, locking and spreading operation.





3 BASIC ELEMENTS

UNI-FORM PANEL . . . Heavy duty — steel-framed, plywood faced.

UNI-FORM TIE . . . High strength, easy break-back.

UNI-FORM TIE KEY . . . Wedge shaped for fast, easy insertion and removal. Reusable.

UNIVERSAL FORM CLAMP CO.
1238 N. Kostner Avenue • Chicago, Illinois

☐ Send me complete details on UNI-FORM Panel System.
☐ SHOW ME! I am sending plans under separate cover.

Name_____

Firm_____

Address_____

City_____ Zone____ State_____

Cut Downtime Losses by Having Tires Repaired or Retreaded While Your Equipment Is Idle

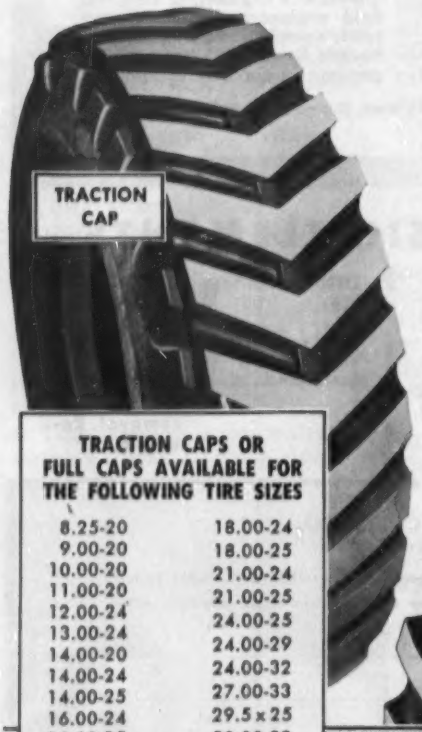


SECTION REPAIRS — Can be handled on any tire with Firestone's repair facilities.

FIRESTONE RETREADS — A special cut-resistant tread rubber compound is added. Scientifically controlled pressure is applied to eliminate air pockets and to give maximum adhesion.



GET GOOD, FAST SERVICE AT Firestone



YOU'RE time and money ahead when you let Firestone handle your repair and retreading needs.

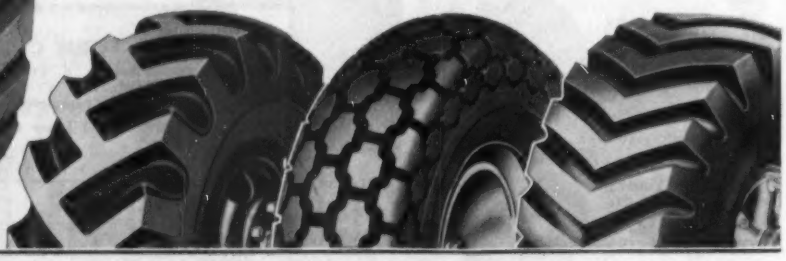
You cut your tire maintenance costs because Firestone is equipped to do the job better, quicker and at lower cost.

You save with Firestone Traction Cap retreads or Firestone Full Cap retreads because they stand up longer and keep your downtime at a minimum. Firestone Retreads have the proved Firestone new tire tread design for greater traction, greater driver control, more hours of service.

Call your Firestone Dealer or Store for faster service on all your repair and retreading needs.

TRACTION CAPS OR FULL CAPS AVAILABLE FOR THE FOLLOWING TIRE SIZES

8.25-20	18.00-24
9.00-20	18.00-25
10.00-20	21.00-24
11.00-20	21.00-25
12.00-24	24.00-25
13.00-24	24.00-29
14.00-20	24.00-32
14.00-24	27.00-33
14.00-25	29.5 x 25
16.00-24	30.00-33
16.00-25	



GROUND GRIP FULL CAP | **ALL NON-SKID FULL CAP** | **ROCK GRIP FULL CAP**

Enjoy the Voice of Firestone on radio or television every Monday evening over ABC

Copyright 1955, The Firestone Tire & Rubber Co.



PSI AT THE TOOL—The Hypodermic Needle pressure gage provides an easy but accurate pressure check at the tool end of an air hose. To check pressure, bend the hose and insert the needle. Straighten the hose and the pressure is indicated. To remove the needle, again bend the hose and work the needle out. No air will escape, nor will the hose be damaged, according to the manufacturers. The gage comes with a needle protector and a carrying case. **—United States Gauge Div., American Machine & Metals, Inc., Sellersville, Pa.**



PROTECTS BEARINGS—Inexpensive molded caps about the size of a thumb nail can help prolong the life of bearings and bushings by keeping dirt, grit and water out of grease fittings. The protective covers, called Pro-Caps, prevent dirt that gathers around unprotected fittings from being forced into bearings and bushings by the grease gun during lubrication. The caps were tested by the Navy under temperatures ranging from -40 to 200 deg, through water, and under off-the-road conditions. They are constructed of Bakelite polyethylene.**—YBF Corp., Warner Bldg., Washington 4, D.C.**

(Continued on next page)

Complete Power Package

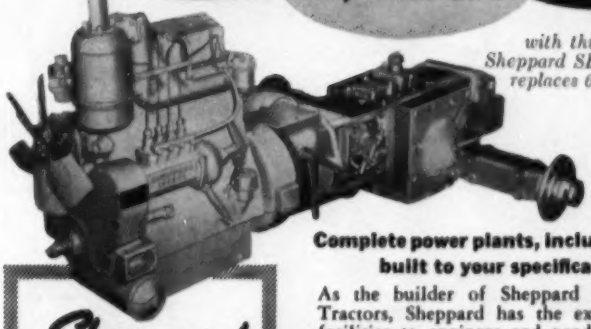
Built by Sheppard .... Drives Most Powerful Farm Tractor

Sheppard Model 16 Diesel

Sheppard 12 Speed Transmission

Sheppard Double Reduction Final Drive

with this drive, the Sheppard SD-4 farm tractor replaces 6 ton crawlers



Sheppard DIESELS
HANOVER, PENNA.



Complete power plants, including drives, built to your specifications

As the builder of Sheppard Diesel Farm Tractors, Sheppard has the experience and facilities to engineer and produce complete power packages. Sheppard welcomes inquiries regarding special applications for Sheppard Diesels in the 3½ to 100 h.p. range . . . will work with you to engineer a complete power train including transmission, torque converter or any special equipment.

Write us today concerning your specific power requirements.

BUILDERS OF DIESEL ENGINES, TRANSMISSIONS, REAR AXLES AND POWER STEERING UNITS FOR INDUSTRY

You can be Sure...

when PROTECTIVE MAINTENANCE is due



HOBBS ENGINE HOUR METERS make it easy to plan a definite program of protective maintenance on your powered equipment. ON-TIME maintenance means longer equipment life . . . less down-time . . . fewer repairs — a more profitable operation in the long run.

ACCURATE—*Not a Revolution Counter*

The HOBBS HOUR METER records ACTUAL RUNNING TIME on all types of powered equipment — stationary or mobile — gasoline or Diesel. This electric timing instrument tells you the HOURS and MINUTES of engine operation — important accuracy no revolution counter can provide.

APPROVED BY LEADING MANUFACTURERS

Installed as original equipment or recommended as an approved accessory by leading construction equipment manufacturers. Ruggedly built — easy to install. See your factory branch, representative or distributor . . . or WRITE:

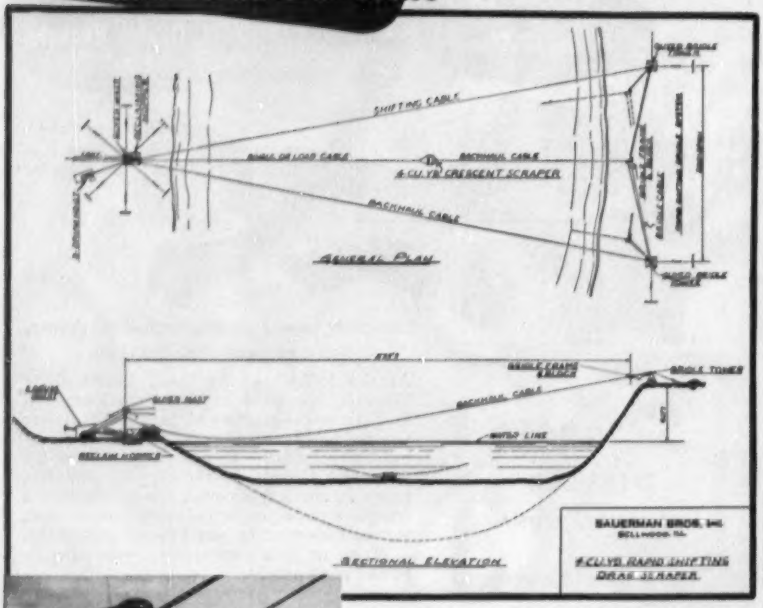
HOBBS *Engine Hour* METERS

Pointer type illustrated; now available also in direct-reading models.

John W. Hobbs Corporation
2070 YALE BLVD. SPRINGFIELD, ILLINOIS
World's Largest Builders of Running Time Meters

the SAUERMAN METHOD.....

Scraper Machines Engineered to Your Operation



Above drawing was prepared for a specific drag scraper installation and does not represent maximum spans.



View shows rapid shifting bridle frame and all operating cables. Crescent may be seen in background conveying load to reclaiming hopper just in front of mast.

•

Contact Sauerman's engineering department for specific recommendations and information. No obligation.

Ask for Catalog A, Drag Scrapers—24 pages of job photos and specifications. Request Field Reports showing your material being handled by the low cost Sauerman Method.

The Sauerman Method works equally well over widely differing areas and span limits . . . on hills, swampy ground or underwater . . . handles any material a dragline can dig.

Every scraper machine is powered by a Sauerman Roller Bearing Hoist, especially designed to withstand sudden shocks and changes in speed.

When a rapid shifter is used, a third hoist drum is added to shift the bridle frame. The rapid-shifting bridle system (upper right of drawing) permits frequent shifting of the scraper's line of operation in non-caving material, shallow excavations or overburden.

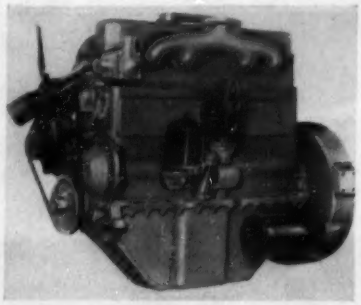
Operating costs are lower—basically, it is cheaper to drag material than it is to lift and transport it. You eliminate the power costs of moving heavy machinery about the area. You pay only for pay loads—not dead weight. When expendable parts—sheaves, clutch or brake linings—are replaced, the machine is restored to practically new condition.

Sauerman can help you select the method of materials handling most profitable for your job—a system that will give you the lowest cost per cu. yd. handled.

SAUERMAN BROS. INC.

612 S. 28th AVE. | BELLWOOD, ILL.

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks



INTERCHANGEABLE ENGINES—Hercules will soon begin production on four new series of gasoline and diesel engines comprising 12 models in four and six-cylinder sizes. According to the manufacturer, the new engines offer four distinct types of optional power in which interchangeability as units and extensive interchangeability of parts have been achieved to a degree new to the engine industry. In addition to redesigned versions of its L-head gas engines and its line of solid injection diesels, Hercules has added a new line of overhead valve gas engines, known as the G.O. series, and a line of direct injection diesels (above) called the D.D. series. The G.O. gas engines are available in three different bore sizes in both four and six-cylinder models with top ratings of 131 hp at 3200 rpm. The direct injection diesels has a maximum rating of 97 hp at 3200 rpm. Cylinder blocks not only are interchangeable between the gasoline and diesel engines of like size, but they are also designed so they can be turned end for end with the flywheel housing and gear cover bolted to either end, permitting power to be taken from either side.—**Hercules Motor Corp., Canton, Ohio.**



HOT SPRAY GUN—The heated solvents in paint evaporate almost entirely between gun and target, leaving a highly solid film of paint

(Continued on page 197)

AUTOMATION ...Another Butler FIRST!



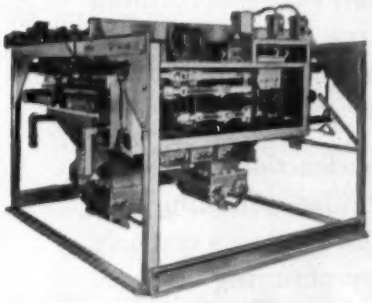


PUSH-BUTTON-CONTROLLED BATCHERS



SAND BATCHER

Discharges two batches simultaneously, electrically controlled at cement batcher, by truck driver, or by operator on sand batching plant.



CEMENT BATCHER

Here one man operates all 3 units or cement batcher alone. Hoppers accurately charged by combination of rotary gate (for speed) and vane feeder (for final accuracy).



STONE BATCHER

Discharges two batches of 2 stone sizes each. Correct proportion of each size stone provided by cross feeds from each battery of hoppers.

Completely Automatic Road Builders' Plant... ONE-MAN-OPERATED

One man . . . one finger . . . one push button controls batching of sand, cement, and 2 sizes of stone — the great new Butler 0-1-0 Automatic Road Builders' Plant. Electric controls at the cement batcher operate any one, two or all three plants — maintaining performance efficiency that easily keeps up with two 34E dual drum pavers.

MASTER CONTROLS are pre-set for any selected batch proportion you need — and can be easily changed for new specifications. If the contractor prefers, the truck driver himself can actuate either the sand or stone batchers without leaving the truck cab.

World's Most Portable Plant

Another exclusive Butler engineering feature is the hinge and pin attachments for supporting columns, which permit amazing savings in erection time — and in relocation. Special electrical connectors between batchers require only quick plug-in — and you're ready to operate in your new location.

BUTLER BIN CO.
WAUKESHA, WISCONSIN



Brown & Root, Inc., builds Peligre Dam in Haiti with Blaw-Knox Steel Forms

• The construction of the Peligre Dam project by Brown & Root, Inc., of Houston, is a typical example of the way Blaw-Knox Steel Forms and Blaw-Knox Engineers' Consultation Service can help solve difficult concreting problems. This buttress-type dam, which will span Haiti's biggest river, the central Artibonite, will be 1075 feet long and 225 feet high.

Among the problems which faced Brown & Root engineers was forming the overhang buttress section. To solve this problem, Blaw-Knox suggested a special type cantilever form.

Whether the construction project is a big dam, tunnel, bridge, retaining wall or sewer, Blaw-Knox engineers can help in the preliminary planning stage to solve difficult forming problems *before* the plans are on the drawing board.

BLAW-KNOX

BLAW-KNOX COMPANY

STEEL FORMS DEPARTMENT • BLAW-KNOX EQUIPMENT DIVISION

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EQUIPMENT NEWS . . .

Continued from page 194

that is quick drying, according to the manufacturer of the Circaflo hot spray heater. The heaters are said to reduce the quantity of solvents in sprayed paint and also to further reduce the paint viscosity beyond the point possible with solvents. This results in lower spraying pressures, which means less over-spray and bounce-back. Designed to handle finishing coats, the gun results in an improved gloss, better build-up and less blushing, according to the manufacturer.—**Spee-Flo Co., 720 Polk Ave., Houston, Texas.**



OIL FILTERS—A bar-type cover handle replaces the usual cover bolts on series 750 oil filters, designed for either external or internal mounting on heavy equipment. A double center-tube prevents drainback without valving and a neoprene type cover gasket provides positive seal. Three Hevi-Duty cartridges are available to meet various types of service. According to the manufacturers, the cartridges will not remove detergents or other additives from today's heavy-duty oils.—**WIX Corp., Gastonia, N.C.**

VERSATILE ELECTRODE—E-6013 electrode for ac or dc current is particularly useful when low open circuit voltage welding machines such as are usually found in small shops are used. Called Fleetweld 37, the electrode provides a steady arc on both ac or dc currents, even when used with welding machines having an open circuit voltage as low as 44 volts. Good arc characteristics are said to reduce electrode sticking sometimes encountered when weld-



HERE'S HOW CARCO WINCHES KEPT A BIG CONSTRUCTION JOB MOVING!

Mired in sticky, blue clay encountered in clearing and grading for the Canadian National Railways, the right of way for a completed 43-mile rail line from Terrace to Kitimat, B. C., is an International TD-24. Campbell-Bennett, Ltd., of Vancouver, B. C., the contractors, met this emergency by winching out the stuck equipment with a Carco model J winch.

Over miles of this mucky clay, tractors were unable to get traction sufficient to push the load in dozing. To solve this problem, two TD-24's with Carco model J winches were anchored back to back on solid ground and attached to a middle tractor by the Carco winch lines. By doubling tractor pulling power, the two Carco winches were easily able to pull the middle tractor back and forth with the blade in play.

Many heavy-construction contractors have found it pays to have one or more tractor-mounted Carco winches on every project in order to overcome the problems and emergencies that slow up construction schedules. You'll find a Carco winch will pay, too. See your nearest Carco dealer for further facts. PACIFIC CAR AND FOUNDRY COMPANY, Renton, Washington. Branch at Chicago, Ill.



The self-energizing, free-wheeling brake of the Carco model J winch gives full braking power with instant automatic operation. The brake takes effect the instant tractor clutch is disengaged, holding load firmly in desired position.



The constant-mesh, 4-stage gear train doubles tractor pulling power by a high ratio of gear reduction. A lower gear ratio in reverse provides faster speed for paying out line. Heavy-duty gears and shafts assure large overload capacity.

The dependable performance of Carco winches has been proven on construction jobs in all parts of the world. That's one reason why Carco makes more winches for more makes and models of industrial tractors than any other producer.

CARCO

Cuts Your Cost for EVERY TACKLE BLOCK JOB



CORRECTLY ENGINEERED

● Because they're designed and engineered for specific tasks, you'll find MADESCO blocks with heavy steel shells and fittings your *safest* choice. In materials, in construction too, Madesco tackle blocks assure you the extra service that comes from over thirty years of specialized experience and "know-how." Buy Madesco blocks and you make substantial savings on your rope costs, because Madesco sheaves (of iron or steel graphite bronze) are correctly-grooved to prolong rope-life. Loads travel smoothly, easily, quickly to save lifting time; that means savings too that come from minimized maintenance and down-time. There's a complete line of Madesco tackle blocks for every need. Consult your industrial distributor—and meantime write for our catalog.

MADESCO TACKLE BLOCK CO., Easton, Pa.

MADESCO BLOCKS

SPECIAL FORGINGS

are also available for varied needs. Write us. Remember too, we quickly furnish

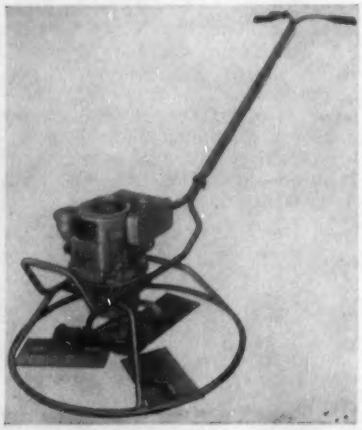
SPECIAL BLOCKS
FITTINGS
REPLACEMENT SHEAVES

designed, engineered and load-rated to your specifications.

WORTH ASKING FOR— BY NAME

MAE—MA—183 156

ing on the low side of the machine's current range. The electrode is available in ⅛, 5/32 and 3/16-in. sizes and comes packed in 50-lb packages. **—The Lincoln Electric Co., Cleveland, Ohio.**



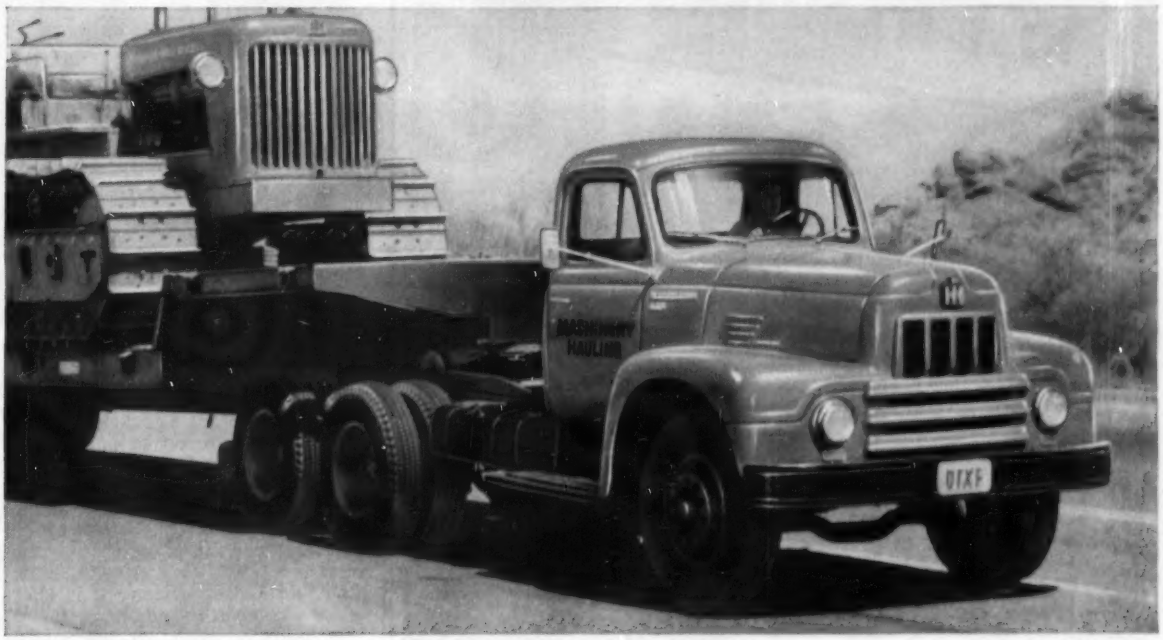
THOR TROWELER—The newly formed construction equipment division of Thor Power Tool Co. has produced a 70-lb power troweling machine called the T-29. Power is supplied through a direct-gear drive by a gas-powered Briggs & Stratton engine that develops 2 hp. Because the three troweling blades are located on a centralized shaft, the machine offers finger-tip control when floating or finishing concrete. Outside diameter is 29 in., permitting access through standard 30-in. doorways. A pull-cord starts the engine.**—Thor Power Tool Co., Aurora, Ill.**



REDESIGNED LOADER—A rocker-type foot pedal operating an over-center clutch now controls the starting and stopping of the improved Adams TraveLoader. Rock the pedal forward to put the machine into motion, and press it backward to stop. There are no gears to shift when stopping, no spring clutch to ride. Tire sizes have also been increased to 13.00-24 lug type, both front and rear, to provide greater flotation and better grip in soft ground. The pick-up moldboard can now be tilted to either side by a hydraulic control from the cab. Other improvements include a shorter paddle-type feeder for placing material on the belt, shortened wheelbase, and an improved gear drive between engine and transmission. The loader, with a choice of two conveyor lengths, is powered by either an I-H gas en-

INTERNATIONAL TRUCKS

First choice of men who know 6-wheel costs



Model RF-201, gasoline-powered 6-wheeler, 39,000 lbs. GVW and 65,000 lbs. GCW.

New — *NEW* Gasoline, LPG and Diesels for a total of *101* models

SF-180 Series—GVW rating, 30,000-33,000 lbs. GCW, 45,000 pounds. Gasoline or LPG engines.

RF-200 Series—GVW, 37,000-41,000 lbs. GCW, 65,000 lbs. Royal Red Diamond 212-hp gasoline engine, optional.

RDF-210-H Series—GVW rating, 37,000-45,000 lbs. Diesel-powered. For highway or off-highway service.

RDF-214-H—GVW rating, 45,000 lbs. Diesel-powered. For heavy off-highway service.

RDF-230-H—GVW rating, 60,000 lbs. Diesel-powered. For heavy off-highway service.

DF-400 Series—GVW rating, 40,000 lbs. GCW rating, 76,800 lbs. Diesel-powered. For highway or off-highway service.

Here are 3 BIG reasons why:

1. **World's Widest Range of 6-wheel Models.** The INTERNATIONAL 6-wheel truck line offers trucks of every size and type from 22,000 to 90,000 pounds GVW—conventional and COE, gasoline, LPG and diesel—all available in hundreds of variations for *exact* matching to the requirements of every job.

2. **Custom-Built on the Production Line.** Years of experience in volume manufacture has created unmatched ability for pinpoint specialization in production line assembly. This means appreciable production savings, and is one of many superiorities that have made INTERNATIONAL the 6-wheel truck leader for 21 straight years.

3. **All-Truck Built to Save You the BIG Money.** INTERNATIONAL 6-wheel trucks are *all-truck* from the drawing board out with every component designed to do a truck job. They *last longer, work more dependably*—to save you the BIG money, the over-the-years operating and maintenance money.

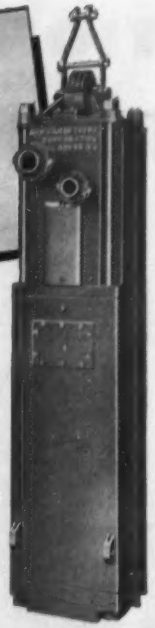
INTERNATIONAL HARVESTER COMPANY • CHICAGO

All-Truck Built to save you the BIG money!

INTERNATIONAL TRUCKS

Motor Trucks • Crawler Tractors • Industrial Power
McCormick® Farm Equipment and Farmall® Tractors

McKIERNAN-TERRY
SINGLE-ACTING
PILE HAMMERS



- The most modern design of single-acting pile hammer on the market, based on more than half a century of specialized experience
- Specially designed for driving into very dense substances such as clay, hard pan, compacted gravel, etc. and for driving heavy mass piles
- Built in a range of 5 sizes.
- All parts completely enclosed for protection against grit, dirt and damage, and for safety
- The only single-acting pile hammers that can perform underwater work
- Many exclusive features for most effective blows, convenient operation and maintenance, and long wear. **Write for Catalog**

MK839

McKIERNAN-TERRY CORPORATION
Manufacturing Engineers
110 RICHARDS AVE., DOVER, NEW JERSEY
Plants at Dover, N. J. and Harrison, N. J.

• Also builders of coal and ore bridges, bulk material unloaders and specially designed machinery.

McKIERNAN TERRY

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BUY EFCO STEEL FORMS

Lifetime steel faces never need replacing
•
Easy to handle and assemble
•
Save time, material, money
•
Low original cost
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Other forms available on a rental basis

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DISPLAY ADVERTISING
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Please forward my free copy of the McGraw-Hill "Industrial Direct Mail Catalogue."

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Company_____
Address_____
City_____ State_____

Continued from page 198

gine or a G M diesel. The Trave-Loader has an estimated capacity of 10 rpm in loose material.—**LeTourneau-Westinghouse Co., Peoria, Ill.**

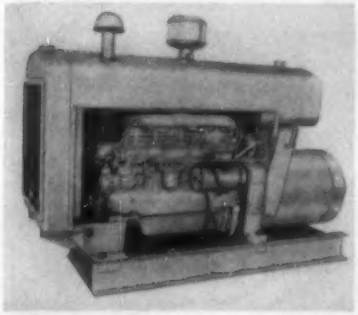


GOOD LUBRICATION SYSTEM—A centralized lubrication system for cars, trucks, tractors and any vehicle with an internal combustion engine automatically delivers a measured amount of lubricant to as many as 30 lubrication points each time the engine is started. Developed by the Alemite Division of Stewart-Warner Corp., the system consists of a vacuum pump from which tubing carries lubricant to a positive displacement measuring valve. A single-line terminating system, it is energized whenever the engine is started. An indicator light on the instrument glows while the system is operating. Under normal operating conditions, the only attention the system requires is refilling the lubricant supply. In installing the system, measuring valves are substituted for fittings at all lubrication points to be serviced. When drive or rivet-type hydraulic fittings are used, a measuring valve with a compression-type nut and sleeve is fastened to the fittings. Lubricant lines are nylon tubing having a 2,500 psi bursting point. The vacuum pump that supplies the lubricant to the lines provides 500 psi at the end of the line. The valves are set to deliver .003 cu in. of either oil or Type O grease to fittings when the engine is started. —**Stewart-Warner Corp., 1826 Diversey Pkwy., Chicago, Ill.**

TUBELESS TRUCK TIRES — The new Power Express line of tubeless truck tires, in sizes 6.00-16, 6 ply, through 11.00-24, 12 ply, are coated with a newly developed tread compound. Called X-99, it is said to reduce the possibility of thread cracking. A double layer of a special polymer lines the inside of the new tires to insure maximum air retension. Notched ribs in the tread increase tread gripping action and improve traction. Longer life, due to lower running temperatures, and sizable weight reductions are claimed for the new tires.—**B. F. Goodrich Co., Akron, Ohio.**



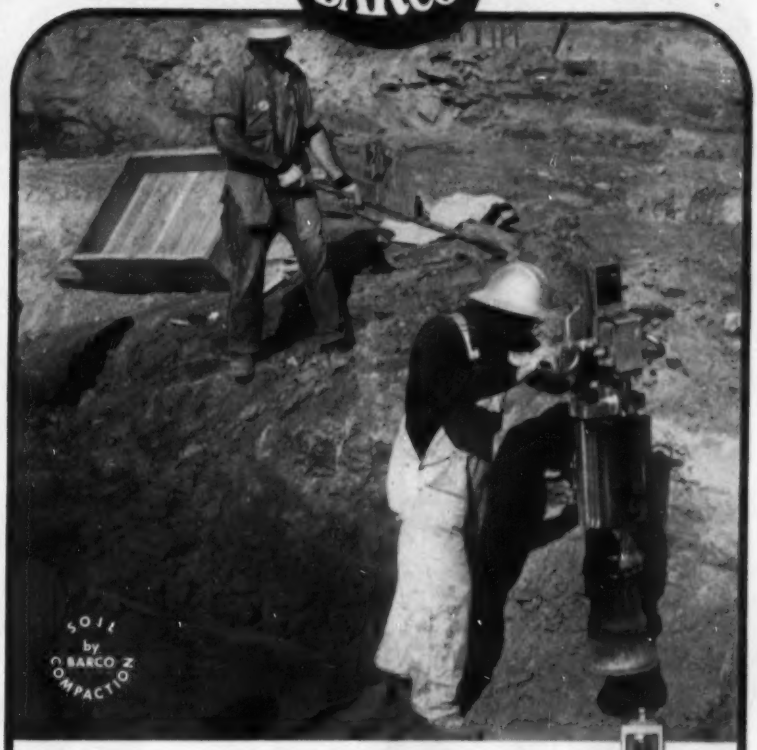
IMPROVED BUCKETS—Several improvements have been made in Haiss' ⅝-yd and ¾-yd clamshell buckets. They now feature oversize dia centershafts, heavy double-ribbed blade arms, sturdy reinforcements welded to side and back plates, and heavy-duty connecting arms. The buckets are also drilled for side cutter attachments. These improvements are now standard for the ⅝-yd and ¾-yd buckets without any increase in price. Haiss is a subsidiary of Pettibone Mullikin Corp. **—George Haiss Mfg. Co., 350 Fifth Ave., New York, N.Y.**



NEW GENERATORS—Universal Motor Co. is now introducing a new series of lightweight, high-capacity generating sets. The new models are powered by 4-cycle, 6-cylinder diesel engines that are coupled directly to the generators. Operating speeds are 1800 rpm. The new 1800 models are produced in 10, 15, 25 (above), and 35-kw sizes that can be furnished with a variety of controls.**—Universal Motor Co., Oshkosh, Wisc.**

LINE COMPLETED—With the addition of the new 210 cfm portable rotary, Worthington has finished modernizing its complete line of Blue Brute compressors, including the 125, 210, 315, and 600-cfm models. The 210 model, like the others, features a newly designed clutch and separate oil reservoir equipped with a pre-heater to assure immediate

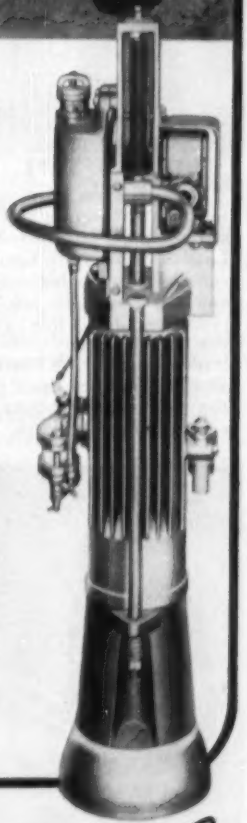
GASOLINE BARCO RAMMER



Barco Performance Pays Dividends!

Job Finished on Time!—When project specifications call for SOIL COMPACTION, Barco performance can't be beat! In test after test, Barco Rammers have demonstrated their ability to deliver 95% to 97.5% compaction (modified Proctor Method)—RAPIDLY! EFFICIENTLY! ECONOMICALLY! The Barco Rammer is especially effective for compacting fill in restricted areas—close to walls, culverts, abutments, around footings, and in trenches—on all kinds of construction jobs: Atomic Energy, Air Bases, Hydroelectric Power and Flood Control Dams, Highways, Toll Roads and Freeways, Bridges, Buildings, and Housing Developments. On area tamping, one man can average 20 to 30 cubic yards of fill per hour. On trench backfill, using lifts up to 24", the rate for 18" trench is 360 to 600 feet per hour.

Ask for a Demonstration—We will be glad to arrange a demonstration for you; see our nearest distributor or write. SEND FOR A COPY OF CATALOG 621.



BARCO *Manufacturing Co.*

512C Hough Street • **Barrington, Illinois**

(Advertisement)



SAFETY INSURED—When a 41,300-lb. section of stone crushing equipment was placed by an American 700 Series Crawler Crane, Crosby Clips were used on all wire ropes to assure maximum safety for men and equipment. Genuine drop-forged, hot-dip-galvanized Crosby Clips, with the famous Red-U-Bolt, are specified for safety on more jobs than any other drop-forged wire rope fasteners.



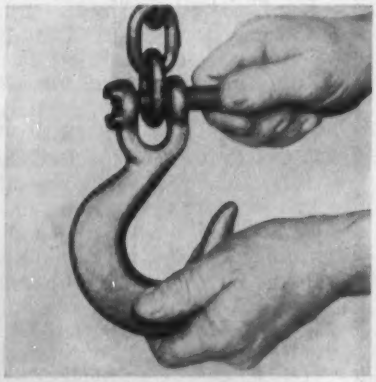
STRONG SAFE, BLOCK

When cofferdam sheetings were about to be drawn from the sucking, grasping soil of the Platte River bottom, a Load-Rated Crosby Crane Block was specified. Made of highest-quality steel, and engineered for safety as well as efficiency, Crosby Blocks are backed by the famous Crosby name—recognized leader in safety. When using Crosby Blocks, workmen can't go wrong, for the safe lifting capacity is embossed right on the side plates.



EASY TAKE-UP

Important design advances by the makers of famous Laughlin Turnbuckles offer added safety and efficiency to users in the construction field. Laughlin Turnbuckle bodies have extra-heavy hex ends which allow fast, easy take-up with a wrench. An exclusive eye design takes the ear of a shackle one size smaller and is stronger than conventional eyes because it conforms more closely to the lines of pull. This design also makes it easier to attach thimbles and other fittings. Exceptionally strong, Laughlin hooks have added heft at points of greatest stress—the ¼-inch hook is actually stronger than most ⅜-inch hooks. Available in a complete range of sizes. A reference chart in Laughlin's free catalog lets you select the proper size turnbuckle for each job.

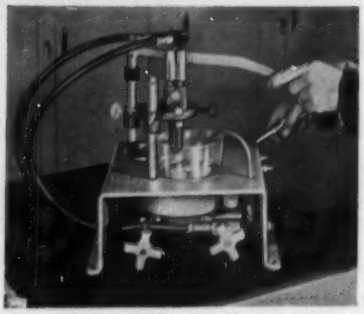


ATTACH IN SECONDS

A more efficient clevis grab and slip hook made by Laughlin has a "Crimp Style", cotter that can be removed and attached in seconds. Available in a complete range of sizes at distributors everywhere, Laughlin Clevis Grab and Slip Hooks are made of drop-forged steel special forging quality and are heat-treated for maximum strength. For free catalog on the complete Laughlin and Crosby lines, write the Thomas Laughlin Division, Portland, Maine, or the American Hoist & Derrick Co., St. Paul 1, Minnesota.

EQUIPMENT NEWS... Continued

cold weather starting. General maintenance and inspection have also been simplified and a gravity-draining design has been incorporated to prevent the danger of oil accumulation in the cylinders.—**Worthington Corp., Harrison, N.J.**



TESTS DIESEL INJECTORS—For the first time, a single tester will check all models of GM Detroit Diesel injectors without major set-up changes. Rack freeness, plunger freeness, spray pattern, valve opening pressure, holding pressure and high pressure tests for all series 51, 71, and 110 engine injectors can be performed on the new Kent-Moore J 7000 injector tester. To adapt the tester for various injectors, simply change the threaded end connectors.—**Kent-Moore Organization, Inc, 5-105 General Motors Bldg, Detroit, Mich.**



CUTS REINFORCED CONCRETE—Kor-It saws clean round holes 1 to 6-in. dia at an average rate of 1 in. per min through reinforced concrete or practically any material. Just set the machine, start it, and turn it off when the estimated cutting time has elapsed. The unit weighs 150 lb, works quietly from 110 or 220-v electrical outlet. A tap from a small water supply keeps the bit cool. The bit is faced with industrial diamonds seated in steel. As the bit saws, pieces of diamond shear off to expose new cutting surfaces that keep the bit self-sharpening. The tool is use-

(Continued on page 205)



Marlow Mud-Hogs work on a deep lift where the sewage line tunnels under a road.



Almost buried in mud, this Marlow Mud-Hog pumps efficiently near the site of the second sewage plant being built for the Jersey City Sewage Authority by the La Fera Contracting Company of Newark.

Marlow Mud-Hogs Solve Major Seepage Problem

Rugged pumping conditions on $30,000,000 sewage project

Garden State Constructors are currently working on a $30,000,000 project to extend sewage facilities from Bayonne to Secaucus, N. J., for the Jersey City Sewage Authority. There are two plants and two main trunk lines feeding these plants that are involved in this job. Work has been under-way for a year and will continue through 1956.

La Fera Contracting Co. of Newark, N. J., one of four contractors united in this joint venture, is handling the west side pipe line construction. They are installing approximately 25,000 feet of 42" to 84" pipe. Cuts run as deep as 30 feet below grade and all are below the Newark Bay sea level.

La Fera selected Marlow Mud-Hogs and used them 24-hours a day with minimum service interruptions and trouble. Frank Grosso, Equipment Superintendent, said, "We use Marlow Mud-Hogs because we found they outperformed all others." Over 15 Marlow Mud-Hogs are being used by La Fera. Other contractors on the same job are using about double this amount.

Because the pumps have performed so effectively, the job has run *ahead* of schedule, despite the constant water problem. Pep Rizzolo, La Fera Master Mechanic, said, "You can't beat Marlow Mud-Hogs for hard pulls involved in deep hole work such as we are doing now."

For a tough dewatering job you can depend on Marlow Mud-Hogs. They take all kinds of abuse and pass trash and debris without clogging. Write today for complete information.

Marlow PUMPS

MARLOW PUMPS
Division of Bell & Gossett Company
RIDGEWOOD, NEW JERSEY
Morton Grove, Illinois Longview, Texas



Using Bethlehem Hollow Drill on U. S. 95, north of Riggins, Idaho. *Excavation Contractor:* Goetz & Brennan, Seattle, Wash.; *Blasting Contractor:* Harding Blasting Co., Portland, Ore. Drill steel and Rok-Bits supplied by Brunner & Lay Corp., Westland Division, Portland.

They Moved 430,000 cu yd of Rock in Straightening Part of Idaho Highway

A narrow, winding section of U. S. 95, in the picturesque mountain country between Riggins and Whitebird, Idaho, was recently relocated by the Idaho Department of Highways. Clearing the way for the 6.7-mi project called for the removal of about 430,000 cu yd of rock. By far the largest percentage of the blast holes were made with Bethlehem Hollow Drill Steel, in 1¼-in. rounds and 1-in. hexagons, fitted with Brunner & Lay carbide-insert Rok-Bits.

The contractor, punching away with jackhammers and wagon drills, drilled blast holes ranging in depth to 30 ft. Although rock conditions varied from very hard to soft basalt, the Bethlehem Hollow performed splendidly.

Bethlehem Hollow Drill Steel is ideal for steady, economical drilling in virtually every type of rock-removal project. This is because it is rolled from an extremely tough, fatigue-resisting steel. Bethlehem Hollow has a wide quenching range, making it an easy steel to heat-treat to obtain the ideal combination of hardness and wear-resistance. It also makes long-wearing threads and rugged shanks.

Bethlehem Hollow is produced in rounds, hexagons and quarter-octagons, and is generally supplied in lengths of from 18 to 25 ft. It can also be furnished in longer lengths to meet special requirements. Give it a trial on your next job!

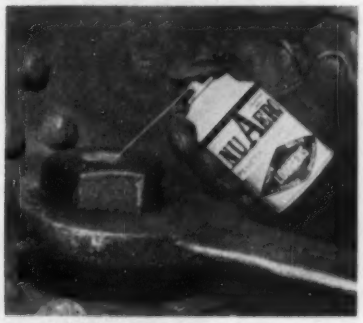
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

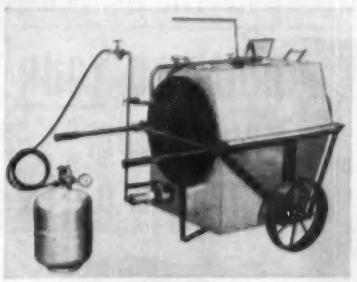
BETHLEHEM HOLLOW DRILL STEEL CARBON AND ULTRA-ALLOY

BETHLEHEM STEEL

ful when test cores from highways or buildings are required, or to prepare conduit lines and piping in existing buildings.—**J. F. Hamlin Co., 750 Ellis St., San Francisco, Calif.**



PRESSURIZED OIL—Nu-Aero penetrating oil, packaged in a pressurized container, will help you loosen frozen fittings, nuts, bolts, or sheaves. The high pressure aerosol steam of oil will carry 4 ft, which makes it easy to reach difficult positions overhead or at distant points. The penetrating oil has been reinforced with molybdenum disulfied, a substance which is said to resist both heat and pressure. Single cans sell for $1.50, 12 can cases, $1.20 a can.—**Pressure Products Co., West Chester, Pa.**

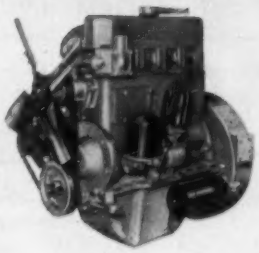


HEATS DRUMS—A moderately priced portable barrel heater allows on-the-job heating of liquid materials in their 55-gal shipping drums. Fired by either bottled gas or kerosene, the Tarco heater delivers a controlled flame along the surface of the barrel. Heat diverting barrels give proper venting before heat is applied to the barrel. A temperature indicator tells the operator when the liquids are hot enough. The unit is mounted on steel wheels.—**Tarrant Manufacturing Co., Saratoga Springs, N. Y.**

FORM CLAMPS—Special pilaster clamps are now available for EFCO forms, The clamps are designed to be used to clamp a 2x4 wood aligning whaler to triple-punched spreader ties that project from the walls adjacent to the pilaster. The clamps are built for situations where it is not convenient to place spreader ties through the pilaster. — **Economy Forms Corp., Des Moines, Ia.**

HERCULES announces new INTERCHANGEABLE models

G.O. SERIES — GASOLINE OVERHEAD VALVE



G.O. 4 CYL.

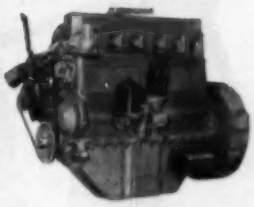
G.O. 4 CYL.

Model	Max. H.P.
G.O. 173	67 @ 3200 R.P.M.
G.O. 198	76 @ 3200 R.P.M.
G.O. 226	87 @ 3200 R.P.M.

G.O. 6 CYL.

Model	Max. H.P.
G.O. 260	102 @ 3200 R.P.M.
G.O. 298	114 @ 3200 R.P.M.
G.O. 339	131 @ 3200 R.P.M.

Also available for L. P. G., Kerosene and Natural Gas



G.O. 6 CYL.

D.D. SERIES — DIRECT INJECTION DIESEL



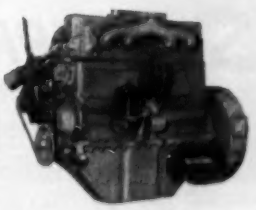
D.D. 4 CYL.

D.D. 4 CYL.

Model	Max. H.P.
D.D. 173	50 @ 2000 R.P.M.
D.D. 198	57 @ 2000 R.P.M.
D.D. 226	65 @ 2000 R.P.M.

D.D. 6 CYL.

Model	Max. H.P.
D.D. 260	75 @ 2000 R.P.M.
D.D. 298	85 @ 2000 R.P.M.
D.D. 339	99 @ 2000 R.P.M.



D.D. 6 CYL.

Additions – to the extensive line of **Hercules Engines**

With the addition of these four new series consisting of 12 models, the Hercules Motors Corporation has increased its line of engine sizes and types to better serve the varied needs of the many industries which require gasoline and diesel engines for their power requirements. This expansion of the Hercules line will enable manufacturers of end products to have a wider selection of engines and power units to meet individual requirements, all available from one dependable source.

Mounting dimensions of the new G.O. gasoline and D.D. diesel four cylinder engines are the same. The G.O. gasoline and D.D. diesel six cylinder engines are also interchangeable from the standpoint of mounting dimensions. Since this new series consists of parallel lines of gasoline and diesel engines, they can be used interchangeably, if desired, in any end product within the recommended engine speed ranges. Further, these engines can be built with manifolds and accessory equipment on either side, as the cylinder blocks are symmetrical and can be turned end for end.

Another important feature of these new models is the great number of parts which are interchangeable between the fours and sixes, and also, between the gasoline and diesel. This greatly simplifies the parts and service requirements. The only essential differences between these gasoline and diesel engines are cylinder heads, manifolds, pistons and fuel handling equipment.

Further information on the G.O. and D.D. series may be obtained by writing the factory.

HERCULES MOTORS CORPORATION

CANTON, OHIO



use JOY SURGEPRUF

. . . THE NON-SKIVE COUPLING WITH THE DOUBLE-WEDGE GRIP

PERMITS THE USE OF MORE ABRASION-RESISTANT, RUBBER-COVERED HOSE

Insure longer wear in your hydraulic hose assemblies—and at the same time, save assembly time by avoiding old-fashioned skiving. Joy Surgepruf re-usable couplings make *both* advantages possible. Their exclusive "double-wedge" grip lets you use tough, abrasion-resistant, rubber-covered hose instead of the braided type—without any need for skiving the hose at the connection.

NO SPECIAL ASSEMBLY TOOLS REQUIRED

You need no mandrels or special tools to make up Surgepruf assemblies. No extra cost or special method is involved.

CAN BE RETIGHTENED WHEN LOOSE ON THE HOSE

Machine vibration or hose flexing can loosen any hydraulic coupling on the hose in time, but Surgepruf Couplings can be easily, quickly retightened on the job to stop a leak—*another* exclusive feature.

Surgepruf Hose Couplings are made to JIC Standards. Assemblies are available in many sizes and lengths, and in both single and double-wire reinforced types for medium-high and high pressure service respectively. *Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*

Write for FREE Bulletin 10-23



New Publications

These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy, write directly to the manufacturer at the address given.

NUTS AND BOLTS—You may not realize that there is a difference in the quality of nuts and bolts. Variations result from the quality of material from which they are made, the type of heat-treating they receive, and the type of inspection given them before they are used. A booklet entitled "Let's Talk Nuts and Bolts," which discusses these variables, is now available.—**Caterpillar Tractor Co., Peoria, Ill.**

CHAIN FITTINGS—A complete line of fittings for wire rope and chain is illustrated in a new 28-p catalog issued by the Thomas Laughlin Div. of American Hoist & Derrick Co. Information includes dimensions and safety factors for links, rings, shackles, swivels, hooks, turnbuckles, thimbles, clips, sockets, ring bolts, eyes and load binders.—**Thomas Laughlin Div., Portland, Maine.**

HOIST TOWERS—A 4-p, two-color bulletin describes Trouble Saver sectional hoist towers. In addition to explaning erection details, the bulletin illustrates the prefitted frames and other component parts and lists parts numbers and weights. On-the-job photos are included.—**Patent Scaffolding Co., Inc., 38-21 12th St., Long Island City 1, N.Y.**

BUILDERS' CONVEYOR—Marion Mule conveyors, specially designed for the building industry, are described and illustrated in a new bulletin. Shown are illustrations of the new 22, 32, and 42-ft models. Also pictured is a new two-handled steel container for elevating mortar, sand concrete and other aggregates. Request bulletin 551.—**Marion Manufacturing Co., Marion, Ohio.**

STEEL GRABS—New bulletin, (No. 0902-1) describes the MSA steel grab, a heavy load grip for either vertical or horizontal pulls of steel plate or structural forms. The steel grab has double-acting jaws which automatically grip both sides of the steel plate when the load is applied. Operating like tongs, the grab takes a tighter grip with increased load. Two sizes are available, the G-118 for thicknesses to 1⅛ in. and weights to 12,000 lb and the G-58 for thicknesses to ⅝ in. and weights to 6,000 lb.—**Mine Safety Appliances Co., 201 N. Braddock Ave., Pittsburgh 8, Pa.**

(Continued on page 209)

REINFORCED CONCRETE DESIGNS...



....all worked out!

• Does away with laborious calculations. Simply locate the table covering the member you are designing, apply span and load requirements, then *read off* concrete dimensions and reinforcing steel data. Follows latest codes and practices. Ten-day, money-back guarantee. No C. O. D.'s please.

CONCRETE REINFORCING STEEL INSTITUTE
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412 PAGES
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38 South Dearborn Street, Chicago 3, Illinois

BUILT TO YOUR needs from standard parts



15-HP SPECIAL PURPOSE HOIST
single fixed drum, worm gear drive

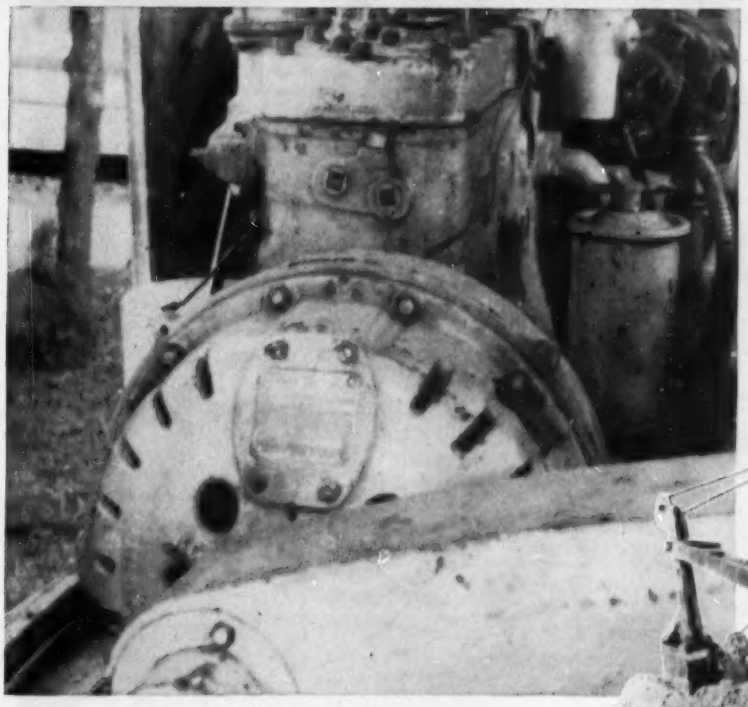
Meet your hoisting needs *precisely* at lowest possible cost. Call on our long experience in modifying and re-combining standard parts to meet specialized hoisting requirements.

Write for bulletins and catalogs

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Main Office and Works:
SUPERIOR, WISCONSIN, U. S. A.
New York Office, 7 Day St., N. Y. 7, N. Y.

Operator Report:



Close-up of Twin Disc Fluid Power Take-Off which protects *both* driving and driven equipment on UC55 Link-Belt Speeder (below) owned by Jack & Jim Maser, Inc. of Brownstown, Pa.



Operator, Daniel Peffley says:

"... Fluid coupling increases production — is easier on machines and operators ..."

"Until a fellow operates a machine equipped with a fluid coupling, the ads concerning its advantages seem like a lot of sales gab. However, from experience gained in eight years of shovel operations—I can honestly say there is a decided advantage in the Twin Disc Fluid Power Take-Off. It *increases* production, and is *easier* on the operator *and* machinery."

The preceding is from an *unsolicited* testimonial by Daniel Peffley, operator of a UC55 Link-Belt Speeder, for Jack & Jim Maser, Inc. of Brownstown, Pa. Since he started operating this machine, Mr. Peffley has worked on a variety of jobs—digging ditches for water lines, lowering pipe, unloading hydrants, pulling pipe under road crossings, and backfilling. In each instance, he says, "the fluid power take-off increased production, extended cable life and made my job much easier."

The Twin Disc Fluid Power Take-Off provides a "cushion" that eliminates shock loads—protecting *both* driving and driven equipment. It prolongs the life of cables and substantially reduces fuel consumption and maintenance costs.

Daniel Peffley's story can be *your* story. *Specify* Twin Disc Fluid Power Take-Off when next *you* buy a shovel. Twin Disc Clutch Company, Racine, Wisconsin, Hydraulic Division, Rockford, Illinois.

TWIN DISC

TWIN DISC

Fluid Couplings

BRANCHES OR SALES ENGINEERING OFFICES: CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • NEW ORLEANS • TULSA



The feet* here are piers used to support Harry Street Bridge, Wichita Kansas. Inland Construction Co., Contr.

Question: How to cross a river without getting your *feet** wet

Answer: Use a **STANG WELLPOINT SYSTEM**



Reason: **ENGINEERING – STANG** provides *on-the-spot* Engineering analysis, Layout Drawings and Field Service all in a tight, efficient "Engineering Package" that handles the details.

AVAILABILITY – STANG maintains fully staffed and equipped depots to service *any point* in the *country* with *any equipment needed* on a moment's notice.

ECONOMY through **EXPERIENCE – STANG'S** many years of experience on all types of dewatering projects assures the most *practical, economical,* and *time-saving solution* to any water problem anywhere—any time!

NOW – If you have a water situation, call **STANG.** You will receive our analysis and recommendations at *no obligation.* Write for Bulletin 100B.

Putting water in its place

STANG ...anyplace!

JOHN W. STANG CORPORATION

Engineers and Manufacturers of Unwatering Equipment, Wellpoint and Pumping Systems
Unwatering Planning—Equipment—Service

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NEW PUBLICATIONS . . .
Continued

HEATER-PLANER—The popular Monatco asphalt heater-planer is described in a new 4-p bulletin. Specifications and on-the-job action photos are included as well as a description of its two hydraulic systems and dual power plants.—**Monatco Mfg. Corp., 1401 Woodland, Kansas City, Mo.**

TIMBER PILES—The American Wood Preservers Institute has published a comprehensive and well-illustrated book called "Pressure Treated Timber Foundation Piles." The treatise covers pile driving formulae, means for determining safe loads, methods of solving uplift and lateral force problems, and protective devices for use during driving. Also included are specifications of the American Society for Testing Materials and standards of the American Wood Preservers' Association for preservative treatment.—**American Wood Preservers Institute, 111 W. Washington St., Chicago 2, Ill.**

TOOL STEELS—A newly revised edition of "Tool Steels for the Non-Metallurgist" discusses properties of various types of tool steels and suggests types recommended for particular applications. Written for the non-metallurgist, the text is confined to direct, familiar wording. In addition to a discussion of basic tool steel types, the book also covers heat-treating techniques.—**Advertising Dept., Crucible Steel Co. of America, P.O. Box 88, Pittsburgh 30, Pa.**

TOOL CATALOG—The Mall Tool Co. has recently published a 63-p catalog to describe its complete line of portable gasoline engine tools. Called catalog 32, the booklet covers the line of MT chain saws, generators, land clearance saws, pumps, earth and wood augers, vibratory earth borers, concrete vibrators, troweling machines, concrete surfacers and attachments, saw chains, and conversion sprockets and accessories.—**Mall Tool Co., 7725 South Chicago Ave., Chicago 19, Ill.**

GE MOTOR CATALOG—A new 28-p catalog of information on AC motors, designated GEC-1026, presents complete buying information on standard AC fractional and integral horsepower motors in most general use. A special section covers horsepower requirements, enclosures, starting current limitations, speeds, motor types and selection of fuses and circuit breakers. Descriptions and specifications include single-phase, polyphase, totally enclosed fan-cooled and gear-type integral horsepower motors.—**General Electric Co., Schenectady 5, N. Y.**

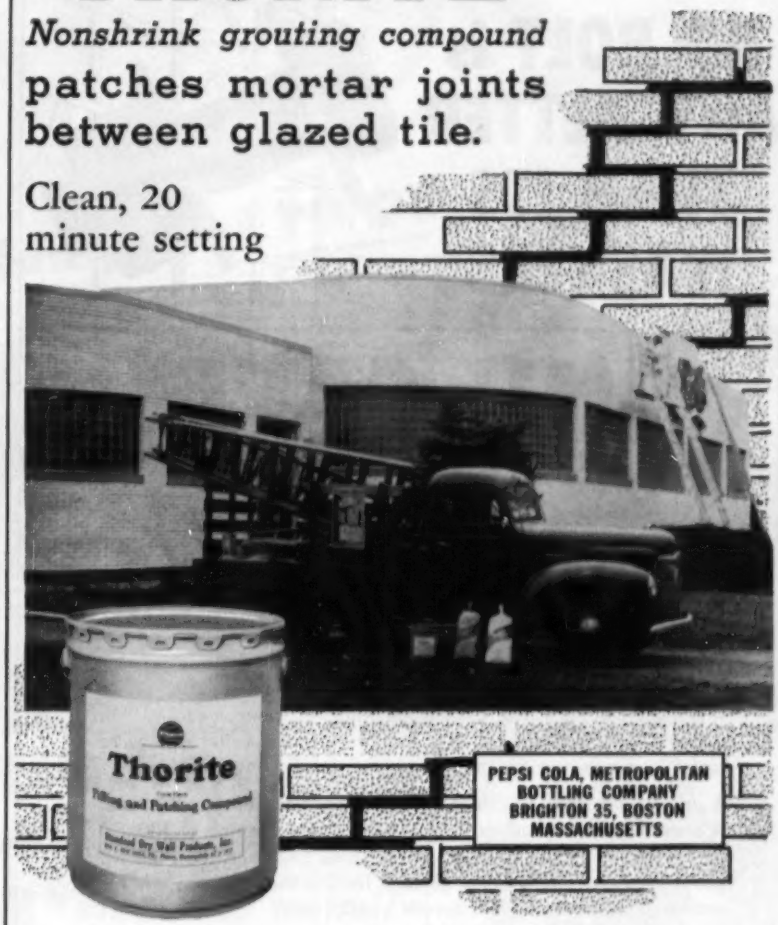
(Continued on page 210)

THORITE

Nonshrink grouting compound

patches mortar joints between glazed tile.

Clean, 20 minute setting



valuable for many uses!

Use THORITE for patching blistered concrete, where reinforcing rods are exposed and corroded, for patching cornices, sills, lintels, belt courses, grain elevators, bridges, underpasses, reservoirs, dams, water filtration plants.

SECURING REINFORCING RODS INTO CONCRETE



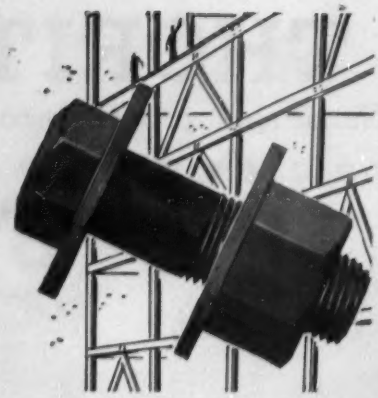
Surface and reinforcing rods are sandblasted and thoroughly cleaned. An application of Thorite, by brush, over rods and concrete, previous to filling patch with Thorite, by trowel, is made.



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STANDARD DRY WALL PRODUCTS INC.
NEW EAGLE, PENNSYLVANIA

Because...

NO BOLT is ANY BETTER THAN ITS WASHERS



It pays to Specify **MIL-CARB*** CARBURIZED **WASHERS**

*TRADE MARK

for STRUCTURAL STEEL FRAMING

Today the swing in field assembly of structural steel joints is definitely toward *High Strength Bolting.* According to competent authorities who have had practical experience with this form of construction and evaluated its benefits, it is possible to *build better* and *build faster* by employing this method of joining steel members.

A primary essential, of course, is to use heat-treated, quenched and tempered bolts to produce a minimum ultimate strength of 120,000 psi for the usual size of bolt. At the same time, nuts must meet a proof load equivalent to the ultimate load of the bolts . . . *and the washers must be hardened, special quality steel.*

And because no bolt assembly is any better than its washers, consistent high-strength bolting should include the use of MIL-CARB Carburized Washers.

MIL-CARB Carburized Washers are fabricated from Prime Carburizing Quality Special Soundness Steel, which insures uniform quality control, always equal to the rigid specifications for this form of steel assembly (ASTM Designation A325, applying to bolts, nuts and washers).

Additionally, MIL-CARB Washers overcome inherent weaknesses often present in heat-treated washers fabricated from steel of questionable quality.

For uniformly sound construction specify MIL-CARB Carburized Washers

Distributed by Leading Bolt Manufacturers and

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NEW PUBLICATIONS . . .

Continued

CONCRETE CURING—"Curing and Protection of Concrete" is a new bulletin that describes the definition, effects and methods of concrete curing. In addition, the bulletin reports the results of exhaustive tests of American Sisalkraft Corporation's method.—**American Sisalkraft Corp., Attleboro, Mass.**

TURBO-DOZER—More than 50 photographs, arranged in film clip fashion, illustrate the operation and correct application of the Michigan model 180 Turbo-Dozer. A running commentary alongside the photographs describes the operational features of the rig, the first rubber-tired dozer powered by a turbo-charged engine.—**Clark Equipment Co., Construction Machinery Div., Pipestone Road, P. O. Box 599, Benton Harbor, Mich.**

STEERING UNITS—A new 12-p catalog describes and illustrates the Harbormaster line of outboard propulsion and steering units for such craft as barges, dredges, towboats, and lighters. Units range in size from 40 to 400 hp, in both gas or diesel models. Included in the catalog are design features, specifications, and photos showing their maneuverability and heavy-duty performance.—**Murray & Tregurtha, Inc., 86 Hancock St., Quincy 71, Mass.**

GALION LINE—The complete line of Transporter, Excavator and Hitchhiker trailer dumps are illustrated in a new 6-p catalog. Also furnished are detailed specifications covering body payload capacities, hoists, chassis details, axle ratings, construction details and other data.—**Galion Allsteel Body Co., Galion Ohio.**

TONS TO PSI—An 8½x11½-in. conversion chart, printed on heavy varnished cardboard, translates tons to psi for all standard test cylinders, and full size and modular concrete blocks, thereby eliminating the need for paper work when making compression tests.—**Forney's Inc., P. O. Box 310, New Castle, Pa.**

NEW MAGAZINE—"How Torque Converters on Shovels Increase Efficiency" is the lead article in the latest issue of Production Road magazine, a publication of the Twin Disc Clutch Co.—**Twin Disc Clutch Co., Racine, Wis.**

ELECTRIC TRUCKS—Specifications, dimensions and construction details of two new electric fork trucks are given in 6-p illustrated bulletins. The trucks are the 4000-lb capacity FT-40 and the 6,000-lb capacity FT-60.—**Baker-Raulang Co., Cleveland 2, Ohio.**

(Continued on page 212)



when the one is a BUFFALO-SPRINGFIELD 3-AXLE TANDEM *with exclusive* "WALKING BEAM" *compaction control!*

On a recent Maine Turnpike project, *one* Buffalo-Springfield 3-axle tandem WALKING BEAM roller handled the pavement compaction instead of the two that otherwise would have been required.

Several sets of twin finishers laid 2,500 tons of hot mix each 11-hour day. The surface was put down in two 1½" thick courses over a 4" thick compacted stone base. Haul from hot mix plant to paving point was handled by a fleet of 15 trucks.

Without expert planning, traffic conditions would have been chaotic. An aggregate truck rolled up to the plant every 3 to 4 minutes, and asphalt trucks arrived and left almost as frequently.

A remarkable high-speed blacktopping job . . . accomplished on a 'round-the-clock schedule by expert traffic management, several twin finisher set-ups, and using Buffalo-Springfield true WALKING BEAM compaction to complete the job with maximum efficiency in the *fewest* number of passes.

Whether your next compaction job is a *special*, or one on which you must rely on maximum compaction accomplished in the shortest possible time—with fewest passes, and resulting highest profits for yourself—you'll be *sure* of unmatched results with a Buffalo-Springfield WALKING BEAM 3-axle tandem roller!

See your nearest Buffalo-Springfield distributor now. Ask or write for Bulletin No. S-71-1255.

Anything less than a genuine Buffalo-Springfield 3-Axle Tandem with WALKING-BEAM Compaction Control is old-fashioned!

BEAM is in "semi-locked" position. Both guide rolls are suspended from a single pivoting beam. End guide roll can rise above, but not go below its normal position.



FIRST guide roll encounters high spot. Walking Beam permits it to pass over the hump exerting only its normal pressure. This "prepares" material for the high compaction of the center roll.



CENTER guide roll rises on hump. This lifts end guide roll off the ground and transfers its weight, along with some weight of the drive roll, to the center roll which now exerts a compaction effort equal to almost 3 times its normal weight.



DRIVE roll exerts normal compaction as it passes over. All this happens when the Walking Beam is in a "semi-locked" position. When unlocked, it follows surface contours. Fully locked, all three rolls are held rigidly in the same plane.

BUFFALO ROLLER COMPANY — **SPRINGFIELD** — **SPRINGFIELD, OHIO, U. S. A.**

THE LEADER IN COMPACTION EQUIPMENT DESIGN AND MANUFACTURE

Ask the man behind the gun . . .

White gives you everything you want in an engineer's transit



Shown, model 7014 with "A" standard. "U" type also available. $675.00* complete with tripod case and field equipment.

WHY are more and more engineers and builders choosing White Engineers' Transits? Basically, the reason is simple: White transits are designed and built for the man in the field. They incorporate all the work-saving, accuracy-boosting features . . . the rugged construction . . . the simplified quality components that you want. In addition, you get coated optics, covered leveling screws and internal focusing Telescope. Wide frame tripod is optional.

YOUR CHOICE OF THREE RETICLES AS SHOWN BELOW —



Fig. I Cross hair arrangement for our standard levels.

Fig. II Stadia hair arrangement for our standard transits.

Fig. III Special stadia hair arrangement, furnished upon request.

To get the details on the complete White line of instruments for Engineers, Surveyors and Builders, write for Bulletin 256. DAVID WHITE COMPANY, 311 W. Court Street, Milwaukee 12, Wisconsin.

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*Prices subject to change without notice.

NEW PUBLICATIONS . . .
Continued

WHITE SIX-WHEELERS—A new folder called "Facts About White Six-Wheelers for the Construction Industry" gives pertinent data designed to increase efficiency of trucks used in all phases of the construction industry. Prepared by the Market Research Dept., it includes background information on engines, frames and axles for both on and off-the-road service.—**The White Co., Cleveland, Ohio.**

CATALOG—The 1956 Porter-Cable catalog, now available, describes 52 portable electric tools and kits and more than 400 accessories. Included are 150 illustrations of tools, their specifications and prices. Ask for catalog 102.—**Porter-Cable Machine Co., Syracuse 8, N.Y.**

FORMING CATALOG — Symons steel frame forms, magnesium forms, wood forms, form hardware, column clamps and shores are described and illustrated in a new publication called the "Symons Forming Catalog." Also available is a 32-p bulletin called "Symons Concrete Forming Equipment" that goes into detail concerning equipment, installation and construction details.—**Symons Clamp & Mfg. Co., 4249 Diversey Ave., Chicago 39, Ill.**

HYDRA-BOOMS—The complete line of I-R hydraulic booms for use in construction and mining is discussed in a new 12-p bulletin that deals with their applications, specifications, and mountings.—**Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.**

GENERATORS—A 4-p illustrated booklet describes the line of electric plans now available from Kohler Co. A chart detailing dimensions, weight and other technical data on various models is included.—**Kohler Co., Kohler, Wis.**

CAT ENGINES—Announcement of two new engines, the D342 and D339, has been made through the recent publication of a mailing piece. Included in the two-color booklet is an explanation of the machining and research behind the engines, illustrations of suggested applications, and a spec list.—**Caterpillar Tractor Co., Peoria, Ill.**

MAINTENANCE—Factory-approved tools and sets for performing maintenance and service jobs on LeTorneau-Westinghouse equipment are featured in Bulletin No. 1W-55. The book illustrates the removal and installation of axles, gears, bearing cups, pinions, hubs, shafts, and sleeves.—**Owatonna Tool Co., 380 N. Cedar St., Owatonna, Minn.**

Save TIME! SPEED WORK!

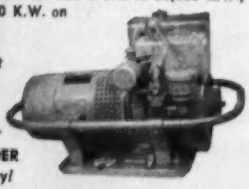


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Your crews can have "plug-in" electricity anytime, anywhere with Katolight Power Plants. Operate all types of electrical tools, equipment and lights. Sizes and models for every portable or standby need from 350 Watts to 50,000 K.W., A.C. Up to 400 K.W. on request.

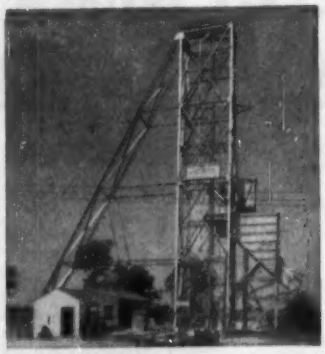
Model at right equipped with accessories to fit your needs.



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Because conditions vary so greatly from one mine or tunnel job to another, a careful analysis of your operation should be made before attempting the design or construction of a headframe. Our twenty-five years of experience on important installations in America, Europe and South America is at your disposal.

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MAYO

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TUNNEL AND MINE EQUIPMENT
LANCASTER, PA.



Two 2¼ yd. Michigans strip asphalt after scarifying with retractable teeth mounted on bucket.

Strips 3600 yds. of asphalt in 8 hours with two Michigan 175A Tractor Shovels

More and more contractors are finding that Michigan Tractor Shovels will handle jobs that have always been considered too tough for rubber-tired equipment. Here's a case in point. C. J. Wilson, Chicago contractor, fitted 1-inch steel scarifier teeth to one of his two Michigan 175A Tractor Shovels to remove 3½ miles of old asphalt on two four-lane streets.

The asphalt surface averaged 3 to 4-inches thick, up to 9-inches at some intersections—a mixture of asphalt, limestone dust, stones up to 1-inch diameter and chunks of concrete—average weight about 3200 lbs. per yard. Wilson found that his two Michigans handled the job 70% faster than a crawler-loader and one Michigan.

C. J. Wilson inspects the 1" steel scarifier teeth he installed on his Michigan 175A.



Used crawler and Michigan

Before he decided to use the scarifier, Wilson used a crawler-loader to cut and scrape the asphalt and loaded it with a 2¼-yard Michigan 175A. This method produced oversized hunks of asphalt up to 20 ft. square which had to be broken up before they could be loaded out. When the weather was hot, the "breaking-up" chore was stubborn and time-consuming. Furthermore, the crawler tracks damaged the macadam base.

Michigans scarify and load

With the heavy-duty scarifier teeth on the Michigan, Wilson found that he could cut the asphalt into strips as much as a block long. The teeth engage when the bucket is dragged backwards with down-pressure to hold them in the asphalt. On the forward pass, they retract automatically and do not interfere with normal use of the bucket.

The two 2¼ yd. Michigans worked a tandem operation. One did all the cutting so fast that it doubled back to assist the other machine which spent full time loading and cleaning-up. Production was as high as 3800 yds. in 8 hours, averaged 3600 yds.—compared to 2100 yds. a day the old way.

Handles tough jobs on rubber

Like C. J. Wilson, many other Michigan owners are finding that this Tractor Shovel will actually improve production on jobs which have never even been tried on rubber. The complete power-train—torque converter, power-shift transmission, planetary axles—was designed and built entirely by Clark, specifically engineered to give this machine more useable power and traction than you've ever seen on rubber. For proof, ask your Michigan distributor to demonstrate. You name the job!

Michigan is a trade-mark of Clark Equipment Co.

CLARK EQUIPMENT COMPANY
Construction Machinery Division
2403 Pipestone Road
Benton Harbor 7, Michigan

CLARK EQUIPMENT



THE STRONGEST WIRE MAKES THE STRONGEST ROPE... THAT'S WHY ONLY 1105 IS USED IN

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WIRE 1105 ROPE

1105 WIRE is the strongest and toughest rope wire that has ever been developed.

Royal Blue is a new all-steel wire rope. It's made of 1105 wire—stands up in service—gives you more for your money because it has more to give.

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IT'S YOUR BUSINESS...

Continued from page 26

1955 failures points out four significant trends:

- Failures increased fastest among contractors doing construction other than building.
- Liabilities rose much faster than number of failures.
- Failures among larger contractors increased faster than among smaller firms.
- Bidding too low caused a heavier toll.

The number of failures increased 45% for contractors doing other than building construction. There were 81 firms in this group, about 6% of total failures. In contrast, there were 3% fewer failures among general building contractors, who numbered 443. Failures among building subcontractors continued to rise, up 11% to 880.

Liabilities of failing contractors topped $83 million in 1955, 46% more than in 1954. The biggest increase was among firms doing other than building construction. Their liabilities jumped 162% to $9 million.

The more rapid uptrend in failures among larger contractors continued in 1955. Of the total, 165 or 12% had liabilities of $100,000 or more at the time they went bankrupt. This is the highest proportion in this group since the figures have been gathered, though it is only slightly above the percentage of firms in this group in 1934 and 1936.

Profitless bidding took a heavy toll of contractors, a continuation of the trend during the last couple of years of stiff competition. This shows up in the 26.1% of failures due in some degree to "competitive weakness" (see table).

Over-investment in equipment also accounted for a slightly greater percentage of failures in 1955. This probably was due to lack of managerial experience and lack of experience in the line of work. Both of these shortcomings were more common causes for failures in 1955 than in either 1953 or 1954. They reflect the influx of a large number of new firms into the construction field as well as the switching from one type of work to another.

Though incompetence accounted for the greatest portion of failures in 1955, the percentage due to this reason was well below either 1953 or 1954.

BIG JOBS OF THE MONTH . . . Next page

WHAT KIND OF CONCRETE JOB HAVE YOU GOT FOR DUMPCRETE?®

Highway Paving?

Low-cost Dumpcretes helped set new records on Garden State Parkway, Ohio Turnpike, New Jersey Turnpike, and other big paving projects. Central mixing eliminated confusion of equipment at site—improved quality—boosted production.



Heavy Construction?

Morrison-Knudsen and Peter Kiewit Sons Co. saved time and money using Dumpcretes to place concrete for world's largest pumping plant and East Powerhouse at Grand Coulee Dam. Dumpcretes have been project-proved by scores of top national contractors.



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Light-weight Dumpcretes pay their own way hauling *and* placing concrete right into forms for foundations, curbs, gutters... speeding up scattered pours... hauling or stockpiling *any* material that flows. No downtime with Dumpcrete.



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BASE COURSE DENSIFICATION at its QUICKEST and BEST



6 COMPACTING UNITS IN WORKHEAD for maximum productivity in straight-away work. Left: Compacting sand fill in a bridge approach . . . another phase of its wide range utility to paving contractors.



4 COMPACTING UNITS just fit this widening job-change required in only a few minutes.



3 COMPACTING UNITS in tandem and staggered, suits this job ideally — a quick and easy change.



1 COMPACTING UNIT fitted with operating handle and narrow base. Just right for the otherwise unreachable spots.



2 COMPACTING UNITS in twin hook-up — self-propelling. One man readily compacts up to 4000 sq. ft. per hr. in 10" layers.

Plus UNMATCHED ON-THE-JOB ADAPTABILITY!

For consolidating granular soil sub-bases and the base courses of sand, gravel, rock or slag in waterbound and penetration macadam construction, there is just nothing that compares with the Jackson Vibratory Multiple Compactor. It not only does the straight-away work in only half the time required by equipment of other types, but is so versatile, so easily adaptable on the job that it can be used to great advantage for widening projects of any width and getting into places other equipment can not touch. As may be noted in the illustrations, any number of compacting units may be used in the workhead (up to 6, which covers 13', 3") to exactly fit the job at hand. Units may be towed at the side or fitted with operating handles and used as individual, self-propelling compactors. Quickly interchangeable bases from 12" to 26" are also available for compacting in trenches, etc.

For compacting granular soil fills of all kinds, the Jackson Multiple Compactor is a terrific cost saver and progress expediter. *It's the predominant medium of consolidation used on the outstanding paving jobs in the country today.* See your Jackson distributor for complete details. We will gladly furnish his name, and literature, on request.

JACKSON VIBRATORS, INC.
LUDINGTON, MICHIGAN

SOME BIG CONTRACT AWARDS OF THE MONTH

Morrison-Knudsen Co., 319 Broadway, Boise, Idaho. Oxbow and Brownlee Hydro-electric projects on Snake River, Idaho, for the Idaho Power Co., 1220 Idaho St., Boise, Idaho. $87,000,000.

Westinghouse Electric Corp., P.O. Box 868, Pittsburgh 30, Pa. Turbo-generator for Avon Power Plant addition at Avon Lake, Ohio, for Cleveland Electric Illuminating Co., Public Square, Cleveland, Ohio. $38,000,000.

William B. Gibson, 5041 N. High St., Columbus, Ohio. Michigan Miracle Mile Town and Country Shoppers City shopping center at Bloomfield, Mich. for Don M. Casto Organization, 4250 Fourth St., Columbus, Ohio. $35,000,000.

Foster Wheeler Corp., 165 Broadway, New York 6, N. Y. Dual circulation reheat steam generator for Unit 3 Meramec Plant at St. Louis, Mo. for Union Electric Co. of Missouri, 315 N. 112 Blvd., St. Louis 1, Mo. $35,000,000.

The Lummins Co., 385 Madison Ave., New York, N.Y. Design and construct oil refinery to produce high octane gasoline, fuel oils and by-products at Portsmouth, R.I. for Commerce Oil Corp., 515 Madison Ave., New York. $30,000,000.

Sessinghaus & Ostergaard, 1115 Peach St., Erie, Pa. Superstructure power plants addition, turbine and boiler rooms at Seward Pa. for Pennsylvania Electric Co., Johnstown, Pa. $20,000,000.

Ebasco Services, Inc., 2 Rector St., New York, N. Y. Design and construct pulp and paper plant at Brewton, Ala. for Container Corp. of America, 38 S. Dearborn St., Chicago, Ill. $27,000,000.

Diesel Construction Co., 625 Madison Ave., New York 22, N.Y. Twenty-six story office building, 123 William St., modernization of 55 John St. and seven-story addition to 156 William St., New York, N.Y. for Ivor B. Clark & Ewin S. Wolfson c/o contractor. $20,000,000.

The Girdler Co., 224 E. Broadway, Louisville, Ky., Synthetic nitrogen plant at Savannah, Ga. for Southern Nitrogen Co., Inc., Savanna, Ga. $14,000,000.

Why buy a truck in the dark?



"Oh, kick me!" cries Merchant Neal,
In a posture hardly genteel.
He bought trucks in haste,
Then the costly fact faced,
That he'd missed the Dodge Dealer's Deal!

If you buy a new truck after looking at only one make, it's like making a deal in the dark. A smarter way to buy is to "*spotlight*" *real truck* value—weigh and compare competitive claims with these Dodge truck facts:

Most standard V-8 horsepower of all leading makes—½-ton through 3½-ton range. You'll make faster trips—get more work done!

Shortest turning radius. You'll maneuver in traffic, and park more easily.

Biggest cabs, with biggest wrap-around windshield. You'll enjoy more comfort, safer vision.

Highest payload capacities . . . pick-ups providing up to 22% more payload than others.

Prices down with the lowest.

Next truck you buy, don't deal in the dark. Turn a bright light on the facts. See Dodge before you buy.



GET THE DODGE DEALER'S DEAL BEFORE YOU DECIDE

DODGE
Job-Rated
TRUCKS
WITH THE *FORWARD* LOOK

NOW Model RD15 Movall, with Positive Ejection, Controlled Spread, for Cat DW15



This rugged wagon hauls 16 heaped yards (12 struck or 22 tons). It works off standard Caterpillar controls, has "dozer-type" ejector that gets rid of loads with a positive, 140,000-lb. push.



Like larger Movall, the Model RD15 can dump at controlled rate into grizzlies or hoppers.

NEW C & D MOVALL MODEL RD15 for hauling rock, dirt, mud or any other top loaded material is designed especially for Caterpillar DW15 Tractors, both new and old; under favorable working conditions it also can be used with Cat DW10 Tractors. Like the larger, job-proved 25-yard Movall, the Model RD15 operates off standard Caterpillar controls, works interchangeably with scrapers, is simple and easy to operate. There's nothing new to learn.

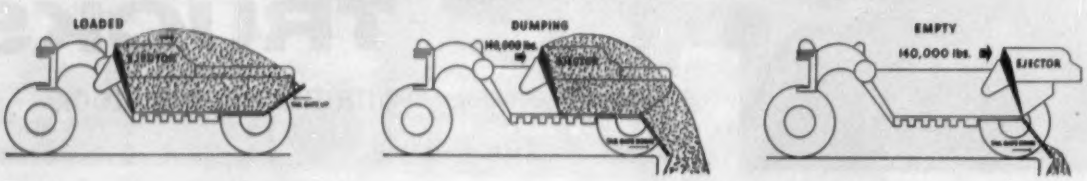
"DOZER-TYPE" EJECTOR PUSHES LOADS OUT QUICKLY—with a powerful, positive force of 140,000 pounds. This cleans the haul unit completely whether you're hauling dirt, rock, mud, gumbo, or frozen ore. There's no build-up or double hauling of sticky material, or time wasted cleaning. The "scraper-in-reverse" design, available only on C & D Movalls, also allows you to place the load anywhere and in any manner you want: over the edge of fill; spread in even lifts of any desired depth; or dumped into hoppers at a controlled rate.

HANDLES ANY MATERIAL YOU CAN TOP LOAD with a shovel, drag line, or belt. You have a large loading target of 10′ x 16′ and short turning width of 27′. You get capacity loads every trip—tailgate minimizes spillage while loading, and during haul. Heaping loads are ejected over a fill in only 11 seconds.

ASK YOUR CATERPILLAR-C & D DISTRIBUTOR FOR A DEMONSTRATION on your job. Find out what a C & D Movall can do for you. Call him NOW or write direct to C & D Manufacturing Co., Perkins (near Sacramento), California. Phone HIllcrest 5-8592.

HOW IT WORKS—Movall uses standard cable scraper power control. To dump, operator releases backhaul drum to drop tailgate, engages ejector drum. Eight-part ejector line gives 140,000 lb. push to boost load out fast and clean. Operator has complete control of discharge, controls spread depth by varying travel speed. After dumping, backhaul line closes tailgate and rolls ejector to loading position.

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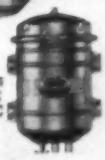

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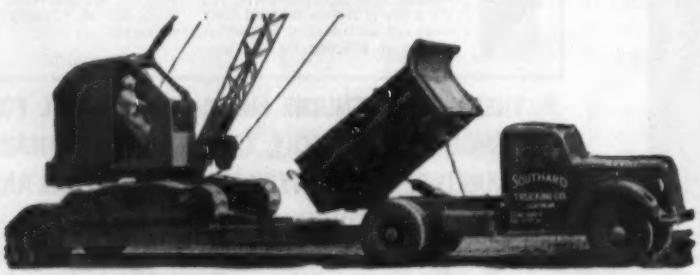
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Attaching of loaded Rogers Tagalong trailer.

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USS COR-TEN Steel pays off

...in this equipment noted for stamina and big capacity!

THIS C & D Movall rock and dirt wagon owes much of its lighter weight, greater strength and greater capacity to the use of USS COR-TEN High Strength Steel in its construction. USS COR-TEN steel comprises 65% of the total material used in this unit, makes possible the 17% savings in weight and contributes immeasurably to its greater capacity—19 cubic yards struck, 25 cubic yards heaped, with a maximum capacity of 31 tons. In the interior of this wagon USS COR-TEN steel is used for the top steel wear plate and the bottom steel plate which form a sandwich around a 2" core of hardwood. COR-TEN steel is also used for the abrasion-resistant wear strips.

As shown here, the C & D Movall, made by Yuba Mfg. Co. for C & D Mfg. Co., Perkins, Calif., is pulled by a CAT DW 21 Tractor, made by Caterpillar Tractor Co., Peoria, Illinois. With a change in gooseneck it can also operate with a CAT DW 20 Tractor. Some of the features which make this wagon especially versatile and popular are its bigger target – 11 by 19 feet, its controlled scraper-like spreading action, its ease of maneuverability, its clean dumping and its safety features.

• • •

C & D, Yuba and other companies specializing in the construction of heavy-duty earth-moving equipment have a long record of use of USS High Strength Steels. This is convincing proof of the ability of these steels to give equipment the stamina to stay on the job.

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For more information on these superior, service-tested steels get in touch with our nearest sales office.

SEE The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

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Our new "Design Manual for High Strength Steels" is ready for distribution. This excellent book contains comprehensive and practical information that you will find extremely useful in designing your product for greater economy and efficiency by the sound use of high strength steels.

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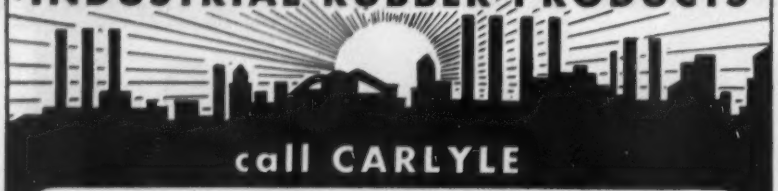
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Carriage Travelling	—	1,200 ft. " "
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Methods Memo . . .

An Opportunity and a Challenge

At ARBA's annual convention in Miami, Fla., H. A. Radzikowski, chief of the Maintenance Branch of the U.S. Bureau of Public Roads, brought right down to earth what the nation's population growth means to the construction industry. The net gain in U.S. population, he said, is 2,500,000 people each year. This means the construction industry must build annually 10 cities the size of Miami with road, street, sewer, water, power, industrial, school, hospital, and business facilities.

Interest in Safety Grows

Associated General Contractors says 2,200 firms, more than one-third of its total membership, now report their accident records to the association. That's a 50% increase over the number that reported in 1954.

From these 1955 reports AGC figures that the average frequency rate was 35.6 accidents per million man-hours worked. In 1954, it was only 31.14. The reason for the increase is that a larger number of smaller firms reported last year. Usually firms with a large number of exposure hours have low accident rates, possibly because they pay more attention to enforcing a well planned safety program.

Cut-Rate Construction

Construction cost of the 110-mi Sunshine State Parkway from Miami to Ft. Pierce, Fla., will be about 20% less than feasibility estimates. The Florida State Turnpike Authority says contracts awarded to date total more than $10 million below estimates. These estimates may have been a shade high, but we'll take a bet that stiff competition among contractors is a principal reason Florida's super-highway will cost less than expected.

$20,000 for Welding Ideas

If you have an idea about how to improve arc welding techniques, it may be worth money to you. The James F. Lincoln Arc Welding Foundation, Cleveland 17, Ohio, is offering $20,000 in cash awards for suggestions that will accelerate progress in arc welding. Top award is $5000. The contest is open to residents of the U.S. and its possessions. There are no restrictions on the ideas that may be submitted. Deadline for entries is July 30.

Unfair to Scientists

Col. Thomas J. Hayes, Omaha District Engineer of the Army Corps of Engineers, tells a story about the search for improved construction methods. Two British scientists, he says, were studying ways to improve construction techniques. They saw three workers wheeling loads of brick, two pushing their wheelbarrows, one pulling. Here, they thought, might be a new technique of value. So they approached the worker who pulled instead of pushing and asked him to answer their question carefully because it might have scientific importance.

"Well, gov'nor," said the worker, "the reason I pull me barrow instead of pushing it is that I just can't stand the sight of the bloody thing."

Girls Explain New Lumber Grades

The West Coast Lumberman's Association enlisted these four beauties to help lumber buyers remember the new names for the various grades of Douglas fir, west coast hemlock, western red cedar, and Sitka spruce. The old number designations give way on March 15 to the names Construction for #1, Standard for #2, Utility for #3, and Economy for #4. The new rule covers more than half of all U.S. softwood. The actual change in the grades is minor. Select Merchantable remains the top grade in boards, and Select Structural is still the top grade in dimensions.



rigid concrete specifications here...



Views of Peribonka River Power Development.
Peribonka No. 1 Powerhouse—located at Chute du Diable, Quebec.
Owner: The Aluminum Company of Canada, Ltd., Montreal, Quebec;
Consltg. & Des. Engrs.: Shawinigan Engineering Co., Ltd.;
Contr.: Fraser-Brace Engineering Co., Ltd., Montreal.

engineers of Peribonka Power Plants employed POZZOLITH* to help meet requirements

Specifications for these important projects were rigid and exacting. Several types and classes of concrete were involved. Engineers insisted on adequate flow and workability without excessive bleeding or segregation.

Field tests showed that despite problems introduced by air-entrapping sands, Pozzolith with its adaptations facilitated production of concrete of the specified qualities, and at a cost far less than by other known methods.

Pozzolith has proved to be an effective aid in producing excellent results and important savings on major jobs across America.

We would welcome an opportunity to work with you to help obtain similar results on your jobs. More details on these and other hydraulic structures in Master Builders Reporter No. 3 —48 pages, illustrated. Copy on request.

* **POZZOLITH**... an admixture for concrete. Key to lowest possible unit water content for a given placeability. Added to the mix at mixer. Pozzolith and its adaptations permit close control of entrained air and rate of hardening to precisely meet job requirements.



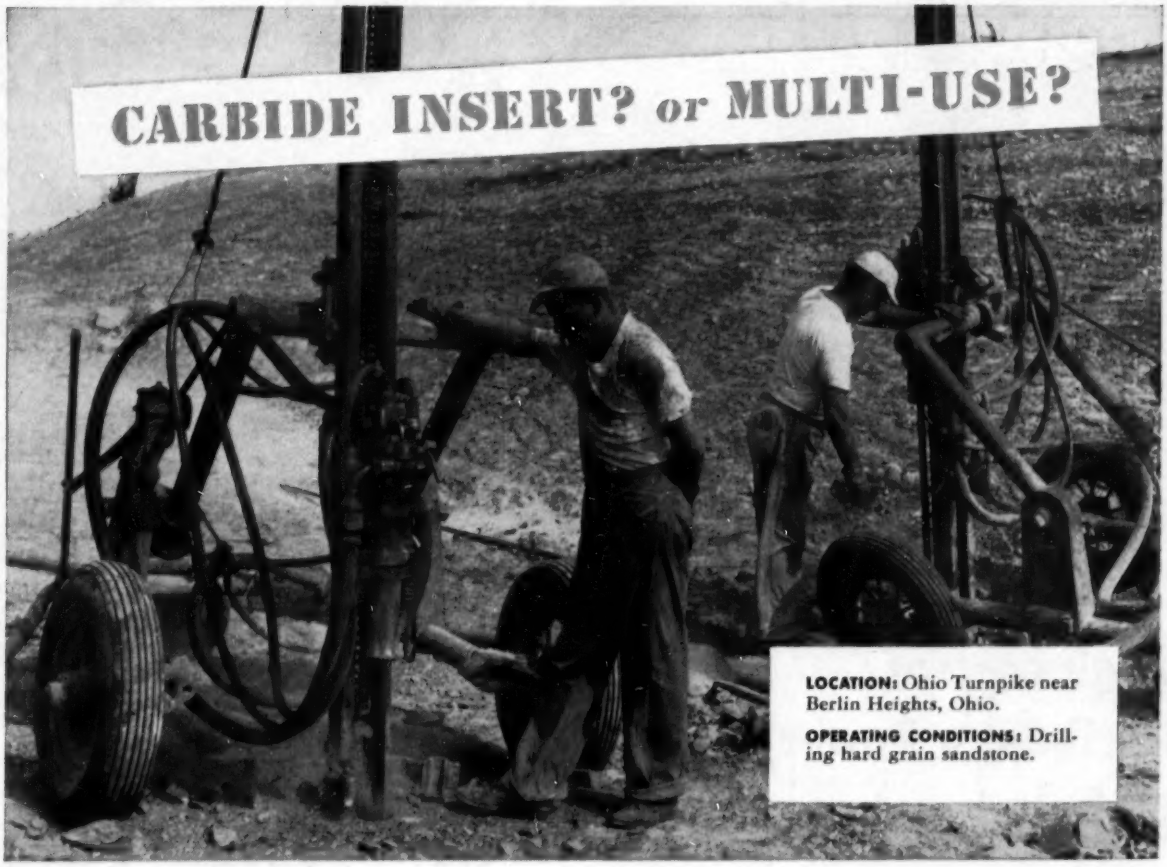
Peribonka No. 1 Spillway—located at Chute du Diable, Quebec.
Owner: The Aluminum Company of Canada, Ltd.; Engineers and Contractor same as Peribonka No. 1 Powerhouse.



Peribonka No. 2 Powerhouse—located at Chute a la Savone, Quebec. Owner and Engineers same as No. 1 Project. Contr.: Pentagon Construction Co., Ltd., Montreal.

The MASTER BUILDERS Co

Division of American-Marietta Company



Switch to TIMKEN® multi-use bits helps lower cost of drilling sandstone on Ohio Turnpike for H. N. Rodgers & Sons Company

WHEN H. N. Rodgers & Sons Company started drilling 230,000 yards of sandstone on the Ohio Turnpike near Berlin Heights, Ohio, they found their costs were running too high. After analyzing their technique, they made some changes. One was a switch to Timken® multi-use bits. Now costs are down. And Timken multi-use bits have been used ever since.

Timken multi-use bits usually give best results when you drill ordinary ground. With correct and controlled reconditioning, they give the lowest cost per foot of hole when full increments of steel can be used.

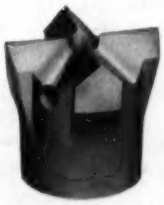
But they may not be the best answer for *all* your drilling problems!

When ground is hard or abrasive, Timken carbide insert bits drill faster and more economically. They're your best bit for constant-gauge holes, small diameter blast holes and extremely deep holes.

Timken multi-use and carbide insert bits also save time when your drillers change bits. They're interchangeable in the same thread series. And dozen of different Timken bits fit the same drill steel.

Both Timken multi-use and carbide insert bits are made from electric furnace Timken fine alloy steel. Both have special shoulder unions that protect threads from drilling impact.

To find out which type bit will cut costs most on your job, call on the Timken Rock Bit Engineering Service. Write: The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".



Timken threaded multi-use rock bit



Timken threaded carbide insert rock bit

your best bet for the best bit ...for <u>every</u> job

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